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LONDON, SATURDAY, DECEMBER 20, 1879.

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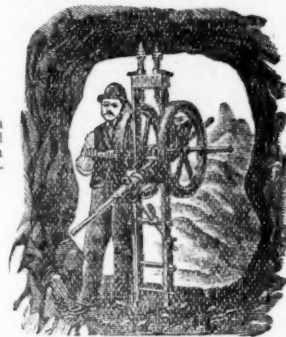
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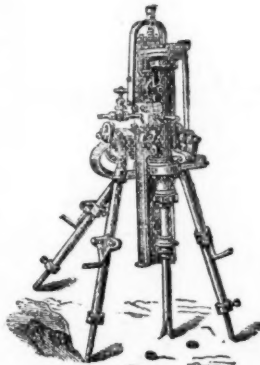
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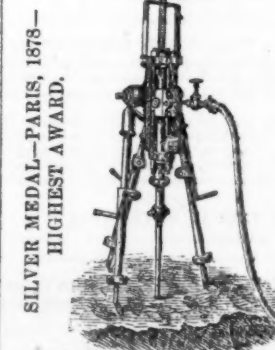
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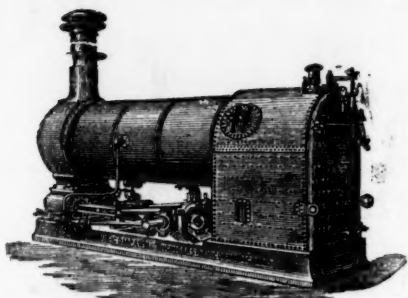
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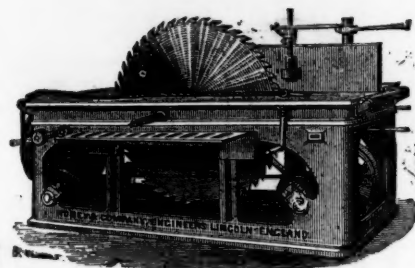
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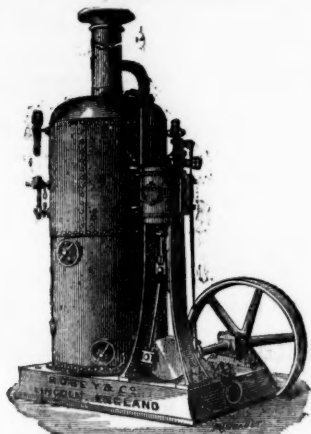
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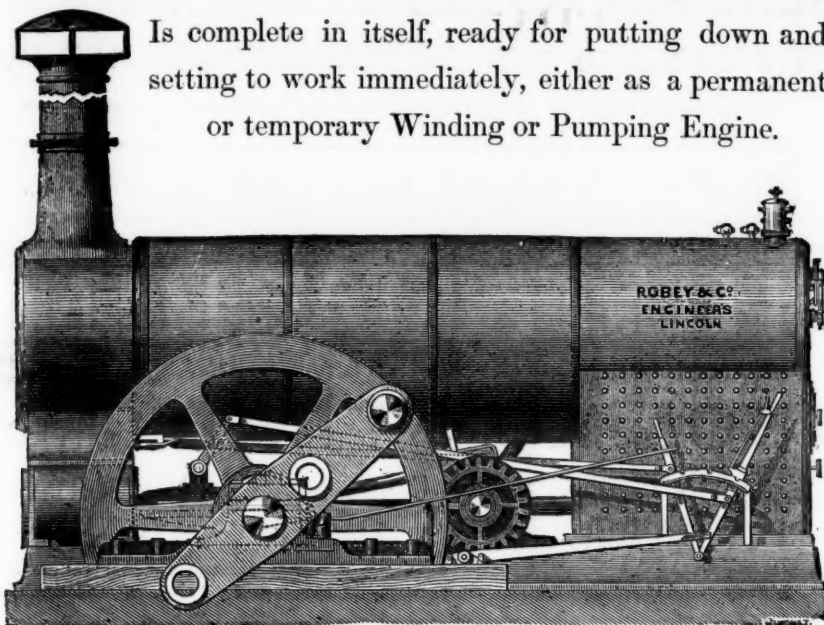
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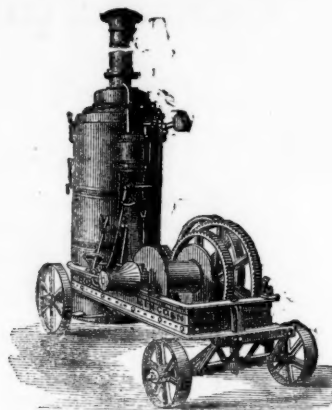
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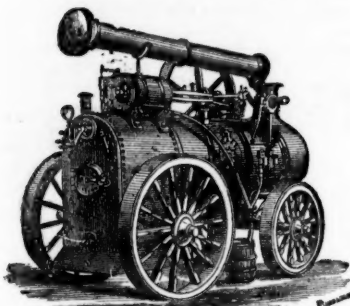
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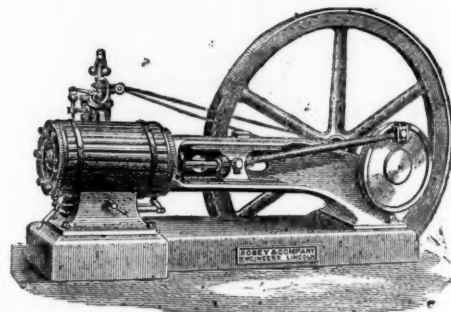
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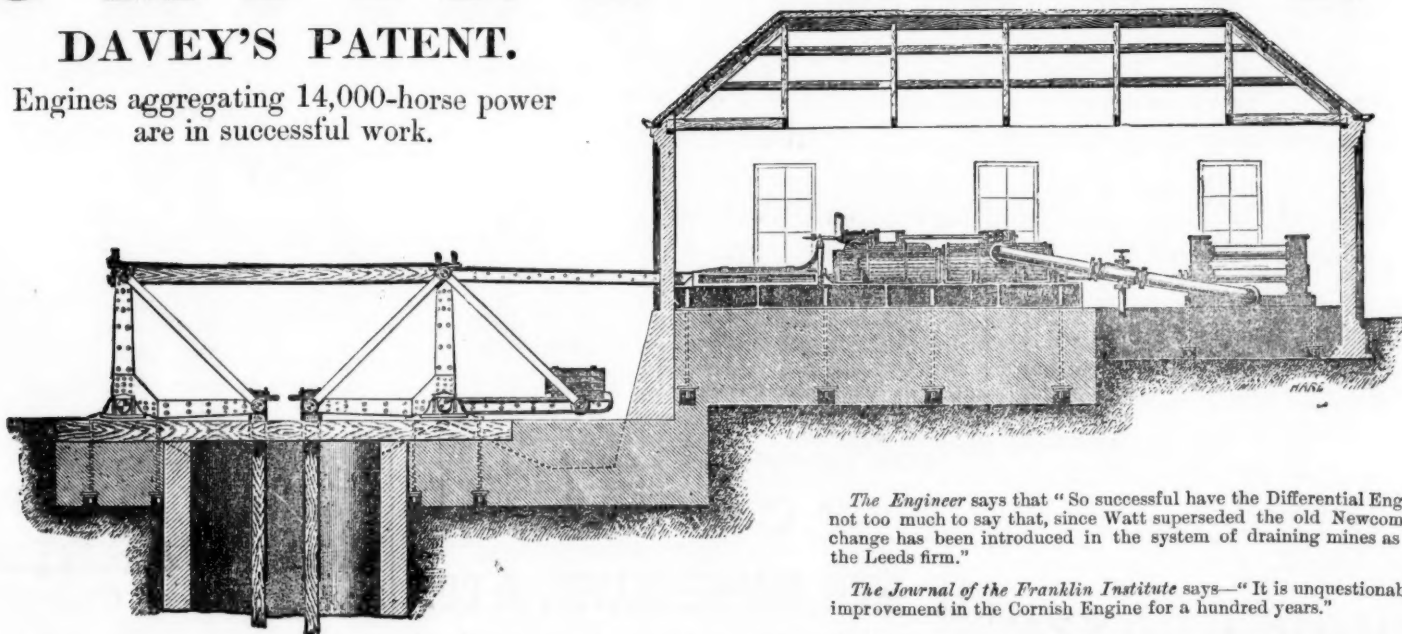
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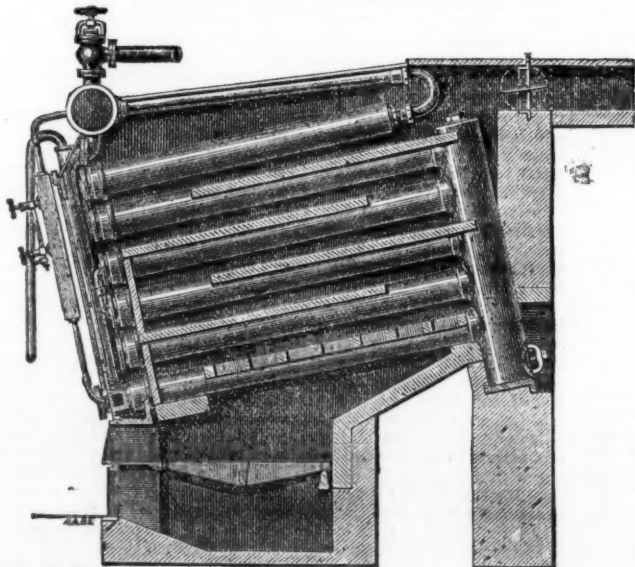
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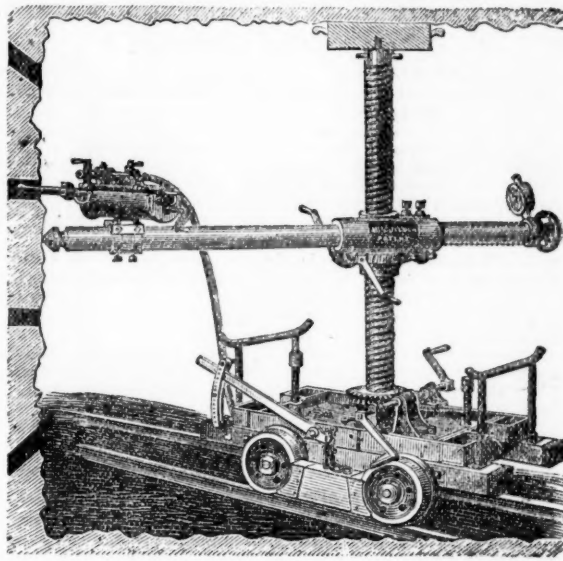
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Original Correspondence.

TRIAL OF EXPLOSIVES—POWDER.

SIR.—May I be pardoned for stating my conviction that the short paragraph under the above heading, which appeared in last week's Journal, was written by no disinterested person? The remarks are confined almost exclusively to the effects of one explosive, the cost per hole of which, however, is studiously omitted.

As the representative of Common Powder used at the recent trials may I, too, be briefly heard? The circular issued by the Committee states that "the object of this first series (of experiments) is simply to test the relative economy of the different explosives as used in hard ground;" and "that the value of powder used will be the standard by which the amounts allowed to the other competitors will be determined—with reference to net market prices."

The total weight of common powder used for three holes was exactly 1 lb.—value at present market price (say) 4d. Cost per hole, one penny and one-third. When this was ascertained the representatives of the so-called strong explosives stated that they could not fire their holes at such a low cost, and were allowed to use as much as they considered necessary—the money value being registered against them. What the exact value was I am unable positively to state, but I think it was about 6d. per hole. The result, however, was this, that in an impartially conducted trial against dynamite, tonite, cotton-powder, and Espir's powder, "in a set of holes equally burdened as far as possible" (I quote from the circular of the Committee), common powder did good duty at a cost of 1½d. per hole, which none of the other explosives named could approach.

Penryn, Dec. 16.

J. W. WILKINSON.

ON STEAM-BOILERS.

SIR.—The material used in the construction of boilers has hitherto been wrought-iron of various degrees in quality—the Low Moor and Farnley iron being pre-eminently adapted for this purpose. Steel boilers are now made to some extent, and as the plates can be used thinner than those of iron there is a quicker transmission of heat through the former. In the case of steel plates, however, greater caution is required in the selection of such only as are properly tempered, and not liable to crack in the expansion and contraction of the boiler, to which they will be subject when brought into regular use.

As the single-tube boiler is almost universally used in Cornwall, so is the double-tube boiler almost exclusively adopted in Lancashire, and is, indeed, now common all over England. The usual proportions of the double-flued boiler being 28 ft. in length, and 7 ft. in diameter, and tubes of 2 ft. 9 in. diameter; but a boiler of 24 ft. or 25 ft. in length, and of the same diameter, is found to be as effective as the longer one. The writer is of opinion that the shell of this type of boiler should never be less than 7 ft. in diameter; there is then a greater range for the water level line to rise and fall in, and much less chance of danger arising from the heating of the top of the tube and its collapse, such accidents having frequently occurred both with the Cornish and Lancashire type of boilers.

As originally constructed the Lancashire boiler had two separate tubes through the entire length; but by the improved arrangement introduced by Messrs. Galloway, of Manchester, the two separate tubes were used only for the fire in each, and were run into one tube, oval in section, which forms a combustion chamber. In this chamber cross water tubes are fixed, varying in number from 6 to 30; but it may be observed that, as now constructed, from six to eight cross tubes are most commonly fixed in each tube. The ring joints, introduced by Mr. D. Adamson, form one of the best and strongest of joints for the furnace tubes; the joints are made by bending outwards the edge of each plate, placing an annular ring between them, and rivetting the three altogether. By this method the tube is greatly strengthened, and capable of bearing great outward pressure; each ring may be considered as an expansion joint, giving liberty for the expansion and contraction of the tube. The longitudinal joints are lapped and single rivetted; the latter joints are so placed that they are not acted upon by the fire, being always under the level of the flame. The longitudinal joints of the shell are usually double rivetted, having either lap or butt joints—in the latter case the plates are rivetted to an outside strip. The ring joints are usually lapped and single rivetted.

The writer is of opinion that the Lancashire boiler, while retaining its advantages in economising fuel and getting up steam quickly, may be modified so as to afford additional security. The dimensions of the improved boiler may be 6½ or 7 ft. in diameter, 24 or 25 ft. in length, the tubes being only 2 ft. in diameter, with six or eight cross water tubes fixed in each. And the furnace should be placed under the boiler: the flame, after traversing from front to rear of underside of the boiler, returns to the front through the two tubes, and thence by side flues to the chimney. The following advantages will be secured by this arrangement:—The flame having the greatest heating effect on those parts of the boiler above it, there would be the lower part of the shell and the top side of the tubes subject to this most effective action; the tubes may be made smaller in diameter, and with less thickness of plates; much less danger is apprehended from the collapsing of the tubes; and there would be greater facilities for employing mechanical firing, such as Jucke's bars, and others, not admissible in flued boilers.

When we consider that the number of steam-boiler explosions in the United Kingdom is about 44 yearly, and the number of deaths resulting from these accidents 50, and personal injuries 80 yearly, it is incumbent on all owners and inspectors of boilers to put forth every effort which shall have the effect of preventing those calamities. It is believed that this modification would be a step in the right direction, and it may be applied in part to existing boilers.

In Lancashire boilers the ends of the shell are usually stayed by longitudinal bars, secured to each end by nuts and washers. Gusset stays are sometimes substituted for these at each end, about five in the upper part and two in the lower at each end of the boiler. These serve to strengthen the two ends—which are a weak part in this boiler—by their attachment to the circular part of the boiler. Every boiler should be provided with two water-gauge glasses, two gauges, and one good steam pressure-gauge in front of the boiler, so as to be within view; also two safety-valves, one water-level float; one blow-off valve, and one low-water whistle.

When a boiler is fired by hand it is almost impossible to avoid the production of smoke, especially when coal is first laid on; it is only by very careful stoking that smoke can be so reduced as to be seldom seen issuing from the chimney; in some places a premium is given periodically to the stoker for care in not producing smoke. Various methods are adopted to aid him in this result—such as the variable admission of air through the doors to facilitate the combustion of the gases; the injection of jets of steam, either constant or at intervals; and the admission of hot air, either at the bars or the bridge. These are each adopted in works where boilers are used to a greater or less extent, but it cannot be said that one of them has been generally adopted throughout the country.

The ordinary valve to regulate the supply of water is the screw-down stop-valve. It is not attached to the spindle, but is made so as to drop of itself, and thus act as a retaining valve; or a separate retaining valve may also be used. At the present day boilers are usually fed by a small engine, instead of, as in former times, by a pump worked by the pumping or winding-engine at a colliery. These small engines, besides feeding the boilers at a slow speed, are often used at full speed as fire-engines in case of any casualty of that kind, or at a moderate speed they may be used for washing out the boilers after cleaning. Injectors are now frequently used in feeding the boilers for stationary engines instead of pumps, and, so far as the writer has seen, they perform the work satisfactorily; but the pump is usually kept as a standby in case of anything occurring to stop the working of the injector.

Of late years considerable economy of fuel has been effected by heating the feed-water. When the water is heated at the end of the boiler flues, as in Green's and other economisers, or with the exhaust steam of non-condensing engines, there is a marked improvement in

the duty of the boiler. There is some difficulty in keeping the economisers in order. Where the water is impure—as is too often the case—incrustation takes place inside the tubes, soot also attaches to the outside of them, and provision must be made to remove these. Berryman's heater is one of the class of heaters for utilising exhaust steam; the feed-water, however, is not mixed with the steam, nor with the tallow and other impurities which come over with it, which often act prejudicially in boilers, but is simply used for heating the water in passing through thin pipes. By this method the water may be raised to the boiling point before it is forced into the boiler. The common methods of heating the feed-water by exhaust steam is to mix the water and steam together so as to raise the feed to near the boiling point, but this method is objected to on account of the impurities contained in the steam passing into the boiler.

ENGINEER.

THE COAL TRADE, AND COLLIERIES' WAGES.

SIR.—In the year 1649 (now 230 years ago) Mr. Grey, in his Chorographia of the Coal Trade, says:—"There come sometimes into this river (the Tyne) for coale 300 sayle of ships. Many thousand people are employed in this trade; many live by working them in the pits; many live by conveying them to the Tyne; many are employed in conveying them in the keels from the stathes aboard the ships. One coalowner employeth 500 or 1000 in his works, yet, for all his labour, care, and cost, can scarce live of his trade; nay, many of them hath consumed and spent great estates, and died beggars. I can remember one of them that hath raised his estate; many I remember that hath wasted great estates. Some South gentlemen have upon great hope of benefit come into this country to hazard their money in coal pits. One gentleman of great ingenuity and rare parts adventured into our mines with his 30,000*l.*, who brought with him many rare engines not known in these parts. As the art to bore with iron rods to try the deepness and the thickness of the coale, rare engines to draw water out of pits, wagons with one horse to draw down coales from the pits to the stathes, &c. Within a few years he consumed all his money, and rode home upon his light horse."

The coal trade of to-day is another instance of history repeating itself. Day by day we hear of collieries suspending operations because they are no longer remunerative, and it is said that within the last four years more than 800 coal pits have been closed because at the present prices of fuel they cannot be worked. It is quite true that during the high prices of coal obtaining a few years ago large sums of money were invested in collieries, but Prof. Fawcett, in his recently published lectures on free trade and protection, says—"When profits are exceptionally low there is just the same inducement to contract a business as there is to extend it when profits are exceptionally high;" and he says further, "In the present state of the coal trade few new mines will be opened to take the place of those which are gradually being exhausted; the supply will thus become restricted, there will be a tendency for prices to rise, and a sudden increase in the demand may again produce a rise in prices as marked as that which occurred five years since; and thus exceptional prosperity and exceptional depression succeed each other in regular cycles." It is generally believed that the great rises in prices was brought about by the action of the colliers themselves through their Trade Unions, but from evidence given before a Select Committee of the House of Commons appointed in 1873 it was conclusively established that the rise in the price of coal was greater, and the advances in the wages of the workmen less, than most people had imagined. At page 191 in this evidence it is stated that in the West Yorkshire district between October, 1871, and March, 1873, when the highest prices were reached, there was an advance of 15s. 5d. per ton in the price of coal at the pit's mouth, while wages in this period were only advanced 1s. 1½d. per ton. During these years the price of coal was raised upon eight different occasions, but only upon five occasions was there any rise in wages, and in every single instance the rise in wages was subsequent to the rise in price of coal.

The output of coal for last year would be about 130,000,000 tons, and to this extent annually our fuel stores are being gradually but surely exhausted. At the present time this is being done without adequate return to the capitalists who have invested their money in these undertakings, and in most cases at a loss of both interest and principal. The time will come when these vast fuel stores must be exhausted. Prof. Marshall, in a work just published—Coal: its History and Uses—(Macmillan and Co.), says that "the Britain with which we are familiar as the factory, the mart, the exchange of the world, with its crowded population, its vast wealth, and splendid material achievements, the very paradise of self-satisfied statistics, cannot possibly continue to exist when the coal, which is the mainspring of its energies, has disappeared, and that there can hardly be a doubt that the period of transition from our present position to that which our resources other than coal could support will be one of social and political trial such as modern statesmanship never yet has had to face. We have accumulated and are accumulating immense debts, great populations, and wide-spread traditions of social comfort and political power among those populations, all which will make the turn of this mighty tide a grave and ominous time. A very sufficient proof of our absolute dependence on coal was afforded us by the coal famine, as it was called, of 1872-3. The confusion and distress then occasioned to us all by a deficit amounting in the whole to not more probably than 1 per cent. of the world's supplies of coal, or 2 per cent. of our own, and the subsequent prolonged depression, and even collapse, for which the high prices resulting from that deficit are largely responsible, are only a premonition of what would ensue were such a deficit to become chronic, and a real coal famine come upon us."

That such a famine may come is possible, and indeed not at all improbable, as I will endeavour to show. Colliery working is at the best one of considerable risk to the proprietor. A coalowner is bound to invest a very large capital before he can commence winning the fuel and send it to market. Mr. Joseph Cowen, speaking in his place in the House of Commons, says he could not insure himself against accidents. A man might buy a ship, insure it, send it to sea, and sink it, and perhaps be a gainer in consequence; but they could not insure a mine, and everybody who lived in mining districts knew numerous instances where men had been ruined through accidents in their collieries. They might make up their minds, therefore, that under any circumstances, even the most favourable, they would always have accidents in these undertakings. As to the colliers themselves, there were hundreds and thousands of men who met with accidents in the mines who, though not killed outright, were maimed for life, and whose calamities were never heard of. The Home Secretary received a list of the persons who were absolutely killed, but he received no return as to the number of men who had their backs injured, their ribs squeezed in, or their legs broken; men who were carried home who might live for a few weeks, a few months, a few years, but who were useless to themselves and a burden to their relatives. During the last 20 years it is calculated that more than 1,000,000 colliers have been killed or injured in the pursuit of their employment in this country.

As a rule, only the sons of colliers become colliers, and it rarely happens that a lad whose father is employed in any other occupation descends a coalpit. The collier's lad is not now permitted to go to work in the pit at the tender age of eight to ten years as formerly, but is sent to school for a few years, and receives instruction which may fit him not only to be a better collier than his father, but it may also be to qualify him to be otherwise employed than as a collier. The wages now being paid to the colliers in some districts are such that where the fathers can find other employment they are doing so, and in many instances which I could name they are emigrating or leaving the collieries with their lads for any other occupation in preference to the darkness and danger of the coal pit at the low rate of wages now obtaining. These lads will become accustomed to what we all enjoy so much—the pure air, the bright blue sky, and the green fields, and within a very short period I venture to predict we shall find colliers scarce. It has often been suggested that the male criminals of our country should be made to work in our collieries, and surely if this might be considered fit punishment for crime, the men and boys who voluntarily undertake the labour at the risk of their lives should be amply repaid for their work. I cannot but agree with

Mr. Ellison that the colliers' wages are cut low enough, and to attempt to still further reduce them would be fatal to the best interests of the country.—*Manchester.* ELLIS LEVER.

MEETING OF NORTHERN COALOWNERS IN LONDON.

SIR.—It has been shown that 16s. a ton, *ex ship*, was taken by the Morley Hotel meeting (Trafalgar-square) as the favourite spot for sensational matters to be discussed) as starting point. With your permission, the average price, *ex ship*, for the last 50 years is 21s., and for the last decade 20s. 11d., thus—1868, 18s. 7d.; 1869, 16s. 9d.; 1870, 17s.; 1871, 17s. 7d.; 1872, 23s. 10d.; 1873, 31s. 7d.; 1874, 24s. 3d.; 1875, 22s. 2d.; 1876, 19s. 7d.; 1877, 17s. 10d.

The coalowners of Durham and Northumberland have had "a good long spell," and although I forbear applying to their benevolent professions for the metropolitan coal consumers what Mr. Gladstone is reported in the Scotsman to have alleged with respect to the Conservative Budget—"It is intended to be true, but there is no truth in it," but as levelled against the coal merchants, with *mort à l'outrance*, let the Durham and Northumberland coalowners take care that the coal merchants, if they are not such as depicted by Homer, Virgil, Horace, Juvenal, &c., do not co-operate with me in delivering seaborne Yorkshire, Derbyshire, and Nottinghamshire excellent house coal at a saving of 7s. a ton on Durham and Northumberland coal, in each case from the pit's mouth to consumer's cellar in the Metropolis, and thus displacing Durham and Northumberland coal in London. The ignoble love of ease and pleasure, the degrading worship of wealth, the senseless extravagance and luxury that follow too often on its possession, the present position and future of Durham and Northumberland coal mining, may reduce the Durham and Northumberland coalowners to take a retrospective glance at the conduct of the instigators and abettors of the so-called coal famine when on the spot, immediately surrounded by coal pits, I cannot bear testimony to any unbounded benevolence towards their less favoured neighbours, many of whom are in the grave now, caused perhaps through the exorbitant price of coal. *Habet Deus suas horas et moras.*

Little Toner-street, Dec. 15. W. JOSEPH THOMPSON.

IMMENSE INCREASE OF REVENUE TO RUSSIA—HYPER-REHABILITATION OF FINANCIAL RESOURCES.

SIR.—Based upon the Board of Trade Returns for 1878, published this year, the official statement—Calcutta, March 15, 1879—of the trade of British India from 1873-4 to 1877-8, the proceedings of the general meeting of shareholders of the Suez Canal on May 29 last in Paris, and the annual report of the Peninsular and Oriental Steam Navigation Company, dated Nov. 25 last, the annual transport receipts between the United Kingdom, India, and China are estimated at 18,000,000*l.* sterling. When it is taken into consideration that upon the lowest computation the transit *via* Siberia can be effected in much less than a moiety of the time occupied by the fastest steamers of the Peninsular and Oriental or other companies, as per the Peninsular and Oriental Handbook of Information for Passengers and Shippers, it is self-evident that passengers, mail, specie, bullion, and all goods traffic will be displaced from the sea route.

To bring this matter to a practical bearing, I am prepared, without calling upon the Imperial Government for the contribution of a single copeck towards preliminary expenses, to proceed to St. Petersburg, and there construct, under the eye of the Government, and work to their satisfaction, a large model gravitation trajectory. Such being, as set forth, accomplished, the exclusive concession in perpetuity of a gravitation trajectory, with embranchments and accessory telegraphic communication, from the Swedish-Norwegian frontiers to St. Petersburg to the extent of the empire in the direction of China, British India, and the seaboard of Eastern Siberia—in fact, the whole empire—with free land and wood to be granted on such terms as may appear good to the Imperial Government. On the China and India routes the concessionaire will keep in constant pay as guardians upon the basis of an excess upon army pay, clothing, and dietary 20,000 disciplined troops, with horses, in block-houses, with duplicate barrack room for double the number, or 40,000 men and horses, ensuring a strict surveillance.

It is well known that an exclusively mechanical genius inspired Richard Trevithick to construct the first locomotive in 1802, its improvement and working being reserved for George Stephenson in 1814—a purely mechanical mind, by no means schooled by a higher class of professional education. The thirst after gain impelled the late York silk mercer—the subsequent railway king—and other *homines* to throw themselves into a vortex of gambling frenzy, amassing fortunes as if by enchantment, so that if we take a retrospective view of the early railway epoch we shall discover a system of gambling unexampled in any age or clime. As the rapid acquisition of mammon was unquestionably at the bottom of our railway system, no serious study has in consequence been given to the technical part, fully confirmed by a Government report. The railway of the present day is identical with the coal wagonway in the North of England before it was imagined to convey passengers by rail. I have frequently travelled on the first passenger line in the kingdom—the Stockton and Darlington Railway—prior to the locomotive superseding the horse haulage, as well as subsequently.

My system, if verified, which I am confident of rendering transcendently self-evident, categorically certain, and syllogistically demonstrable, will place Russia on a still more exalted summit of power. The progress of philosophical investigation and the rapidly increasing accuracy of human knowledge render science susceptible of mathematical demonstration, and clear and indisputable principles being universally recognised, the coincidence of deduction will necessarily follow. I feel assured of being met in Russia by men of exalted understanding, which predominates in the Muscovite race, who will look into the truth of things, and in their own quiet contemplation rise superior to the outward superficial world.

Little Toner-street, Dec. 15. WM. JOSEPH THOMPSON.

MANUFACTURE OF COPPER AND NICKEL.

SIR.—Although there was so much noise a short time since about the more general use of nickel in consequence of the great discoveries in New Caledonia, the matter seems now to have entirely fallen into abeyance; it is now, however, as I understand, to be revived, by the discovery of a simple and inexpensive process of treating what is here called kupfernicker. Mr. Tooke Straker, an engineer of Birkenhead, has arranged quite a novel treatment of ores and materials containing copper and nickel, or either of them, whereby a larger percentage of these metals is obtained at less cost and in less time than has been possible hitherto. The ores are first smelted or reduced in a cupola or blast furnace, an air blast and fluxes being used either at the ordinary temperature of the atmosphere or at a high temperature, so as to obtain a product containing a relatively high percentage of copper or nickel. After treatment in the cupola furnace the regulus is transferred or allowed to run direct into a furnace which he calls a concentrator furnace. This consists of a nearly rectangular furnace usually for economy in working placed on a lower level than the cupola or blast furnace. In or about the crown there is an opening or chimney to allow the gases to escape. At the sides usually opposite to each other, and set at an angle, air tuyeres are fitted in such manner that the air blast is directed on to and amongst the material on the hearth. The distance or depth of the hearth from the nose of the tuyeres is from 8 to 20 in., the distance being greatest when the air pressure is highest.

By means of the blast, aided, if desired, by oxygen-bearing materials such as black oxide of copper, nitrate of soda, or equivalent substance, which upon being heated will readily yield oxygen, the impurities contained in the regulus are oxidised or volatilised out, the principal impurities being sulphur, iron, and arsenic. With the object of forming a fusible slag of these oxides there is placed in the said furnace previous to the commencement, or during the operation, silica or material containing silica in the necessary and well known proportions to unite with the oxidised metals and in quantities varying with the quantity of materials to be treated. From time to time the slag formed is run off, thus exposing the remaining regulus to the more intimate action of the oxidising flame; or if it be found more convenient in practice the regulus slag are allowed to remain in the furnace until the operation is completed.

The invention is practically a Bessemer process for metal, since

Mr. Straker states that instead of having the carbon or like material in contact with the metal to be concentrated, coke or other heating agent, only in sufficient quantity to raise the materials to a high temperature at the early part of the operation, is used, and afterwards the metal and other substances are maintained in a liquid state by the heat given off by the oxidation of the sulphur and iron aided, if desired, by waste gases from blast furnaces or by other heating gases, the said gases, if blast furnace gases, having been previously purified (say) in a water tower. In some cases heating gases may be provided by passing a current of air through, amongst, and in contact with incandescent coke contained in a retort or tower placed preferably close to the concentrator furnace. The subsequent refining process has nothing peculiar.

Bonn, Dec. 16.

TIN, AND ITS HISTORY.

SIR,—As a considerable amount of interest at present attaches to everything connected with tin and the tin trade, the subjoined chronological and historical sketch will no doubt, be acceptable to many readers of the *Mining Journal* :—

1800–1500 B.C. to 1100–900 B.C.—The Chinese bronze industry is in its bloom. 1000 B.C.—Tin was known in the countries of the Mediterranean Sea. Spain and Cornwall are the chief producers. The Phoenicians led the trade. 300 B.C.—The Egyptians make trade with India, wherefrom they import metals. In the first millennium after Christ.—First the Abyssinians, then the Arabs, trade with India. Malacca and the south-east provinces of China were from old times the greatest producers.

The Greeks and Romans used tin for the fabrication of bronze, for tinning copper, and for looking-glasses. They got tin from Spain and from England (*via* Mar-seilles).

In the sixth and seventh centuries church bells were introduced from India to Byzantium and Italy.

About 1200 Graupen and Schönbefeld, in Bohemia, are named as tin producers. They enter into competition with the English tin on the market of Bruges.

About 1200 the production of Cornwall was less than that of the Devonshire stream works; but in the following century the tin mines of Cornwall already preponderated, and the production of Cornwall has continually increased until now, as the production of Devonshire has decreased.

In the time 1300–1500, the Cornwall tin mining was able to bear 40 per cent. of the gross production as duty; about 1600 they paid 30 per cent.; 1750, 20 to 15 per cent.; 1830, 10 per cent.; but the sum to the Duke, half to the proprietor of the land. Since 1838 the duty to the Duke has been abolished.

In Italy, in the 15th century, much tinware was used. Italian tinfounders worked in Prague.

In the last centuries of the Middle Ages Köln and Bruges dominated the tin trade. From Bruges Italian merchants brought the metal to Italy, and to the Mediterranean countries.

In the course of the 15th century the tin production increased, in consequence of the introduction of cannons.

Altenberg, in Saxony, has been wrought since 1458; the streamworks give 300 to 500 tons per annum.

In the beginning of the sixteenth century Schlackenwald (north-west of Bohemia) flourished. The mining of this town increases as the streamworks of the neighbouring town of Schönbefeld decrease.

The ore-bearing rocks everywhere in Bohemia and Saxony are gained by hammer and wedge, or by fire setting. Mortars and hand-mills for crushing and grinding the rocks were used at the end of the 15th century.

At the beginning of the 16th century stamps were invented; the ore roasted; unclean tin washed.

The chief producers are Schlackenwald (which with Schönbefeld and Lanterbach produces 500 to 1000 tons per annum), Ehrenfriedersdorf, and Altenberg.

New streamworks were discovered at Eibenstock, Platten, Gottesgab, Albertau, Hengsterben. Platten flourished about 1550. In Italy tin was used as foil and for enamel.

From the beginning of the 17th century the Dutch brought about a great part of the tin trade from India to China. The greatest quantity of tin goes to China. Some hundreds of tons are imported from Malacca to Europe.

In Cornwall the working time of the miners was four hours, whereas in Bohemia the ore was generally produced by fire-setting. Working by trenches or boring and wedge was common in Cornwall.

German miners introduced the stamp-works into Cornwall. The dressing was improved. Becher, the German alchemist, taught how to melt the tin ore by means of mineral coal in a reverberating furnace.

In Bohemia and Saxony the great war destroyed nearly all industry for 100 years. Many towns and mining districts have never recovered.

The tinning of iron was known in Saxony from the beginning of the 16th century; very common in Bohemia about 1600; introduced into England about 1670, and later into France. In 1630 Drebbel taught the use of tin salt for dyeing. Cornwall produced over 1000 tons of tin in 1700; six hours working time then being common. Powder was introduced into England by German miners.

During the 18th century the tin mining of Bohemia and Saxony recovered and flourished a second time. But since the end of the last century most mines of those countries have been worked with loss. During the present century nearly all the tin mines in Bohemia and Saxony have ceased to produce.

About the middle of the 18th century Newcomen's fire-engine was introduced into the Cornish mines; and 20 years afterwards Watt's improved engine gained the victory. The metal was smelted generally in reverberating furnaces; only the clean stream tin was smelted in blast furnaces with charcoal.

At the end of the 18th century Tunk Ceylon produced 200 to 500 tons of tin. Every year 500 tons of tin were transported to the metropolis of Siam. Malacca produced 1500 tons. At that time England produced more than 3000 tons, and since 1850 more than 4000 tons a year.

About 1820 the working time in Cornwall was eight hours (in 1700 six hours, and about 1600 only four hours). The first steam stamp-work was introduced in Cornwall in the year 1823. About the same time fire-setting was still in use at Altenberg, in Saxony.

The price of tin in Cornwall from 1650 to 1750 was about 65s. per ton; at the end of the 18th century it rose to 90s. per ton.

Round buddies have been in use in Cornwall since 1842; and the extraction of iron and copper by sulphuric acid was then introduced.

Malacca produced from 1820 to 1860 an average of 2000 tons per annum. The production has since considerably increased. England alone importing therefrom an average of 5400 tons per annum from 1860 to 1870.

About 1850 the cylindrical sieve for dressing was adopted in Schlackenwald; the ore now being roasted with common salt. Roasting the ore with soda has been introduced in England since 1858.

Banca produced at the end of the last century 3000 tons of tin annually. In the beginning of the present century the production decreased one half. From 1850 to 1860 the production exceeded 5000 tons per annum, then again decreased.

Bilington produced above 1000 tons in the year 1860; in 1870 and following years it exceeded 4000 tons.

Since 1850 tin from Bolivia is mentioned; the export therefrom is insignificant. Granada has sent nearly 100 tons per annum from 1850. Since the middle of the present century tin has been mentioned from many places in the United States (Maine, New Hampshire, Pennsylvania, and California). There was some tin-humbug for a time.

Java has exported to England 200 to 300 tons of tin annually since 1870. Peru sent 200 to 500 tons to England annually from 1860 to 1876.

Sinkep (near Malacca) has produced during the last ten years 500 to 600 tons per annum.

In 1853 the Australian, and in 1873 the Tasmanian stream works became known. The great increase of production in both countries is known. The consumption has adapted itself to the increased production.

Tin-plates are used in great quantities for kitchen utensils, baths, furniture, and preserve-boxes.

Phosphor tin (phosphor bronze) is much used. The efforts to gain the tin out of the plate chips have proved successful; and in the course of the last ten years much of the tin once wasted is now saved.

Glacis, Graz, Austria. DR. REYER.

* Instead of the import of tin ore I give the respective weight of tin (100 ore = 60 tin).

FLAGSTAFF SILVER MINING COMPANY.

SIR,—In last week's *Journal* "A Shareholder" speaks of something going to happen in February, and that a broker has 2000 shares to buy. Can he tell his brother shareholders what is likely to happen? And as he appears to know so much about brokers, can he tell us anything about the movements of certain brokers who lent money on 3000 Flagstaffs, and who are trying hard to force up the shares to repay themselves? Talking about "30,000l. a-year" does not help the shareholders to the property, the greater portion of which, it now appears, they never rightly owned. Unless shareholders are prepared to put their hands into their pockets and pay their debts, buy new property, and make a fresh start, my advice to them is to avail themselves of the "market" which the brokers have made in the shares whilst there is yet opportunity to do so.

A LATE SHAREHOLDER.

FLAGSTAFF MINING COMPANY.

SIR,—The following extract from the Salt Lake Daily Tribune of Nov. 16 is in confirmation of the finesse practised upon the Flagstaff shareholders, as pointed out in the letter of "Salt Lake" in last week's *Journal*.

"LARGE MINING PROPERTIES—THE ADVANTAGE OF CONSOLIDATING CLAIMS IN MINING DISTRICTS.—Mr. Croly, secretary of the Bullion Club, of New York, in a lecture recently delivered, advised capitalists to invest in mining property of large area; or, in other words, to combine in one property a number of contiguous mines or mining claims. And this for the purpose of protecting themselves against litigation, and to cover any mistakes made in the original location of a vein, where, as might subsequently and unfortunately appear, the strike of the vein did not correspond with the side lines of the located claim. The Flagstaff of Little Cottonwood is a case in point. There an extensive claim, made under the law of 1865, was located at nearly right angles with the vein, and the ruinous mistake, made apparent as developments in the mine were made, has caused immense loss to the English company that bought the property and its fruitful crop of lawsuits. Had the original locators or purchasers secured the adjoining ground by claim or purchase at a trifling expense costly litigation would have been prevented, and immense wealth added to that famous mine. A mineral vein once discovered untold possibilities wait upon its opening, and the quicker its owners secure adjoining ground, so that whichever way the vein

may run they may have sea-room to sail their fortunate ship, the better for them and their successors."

Is it too late now to buy back the portions of the lode which should have been included in the Flagstaff purchase? If not, why should not the shareholders subscribe a sufficient sum to do so? It appears that 60,000l. would suffice to pay off all the debts of the company, and get back the mine free of incumbrances, and if such a sum as 30,000l. a year can be made as profit surely the shareholders will not object to pay 2s. per share for this object, which would make their shares worth, perhaps, 4s. or 5s. per share.

ANOTHER SHAREHOLDER.

CHONTALES MINING COMPANY.

SIR,—In the *Journal* of last week I read your remarks respecting directors having the power to vote or receive proxies when a director is elected. I thing it would be well that new companies about to be formed would take the initiative in the compilation of their Articles of Association. Allow me to make a few remarks in respect to the shareholder who proposed Mr. Wethered. You will find his opinions expressed in your columns of a former occasion on that subject, that it is a matter of indifference to him who the party is, or from whence he comes, if he possesses the necessary qualifications for a seat on the Chontales board; that he would have been equally as pleased to support the directors had they produced a gentleman qualified so much as Mr. Wethered, and it would appear strange at the present time that they (the directors) had not brought forward some gentlemen after the statements made by Mr. Parke Pittar that he would be absent for some months. Unless he is going out to the mines, the time of absence he gave would enable him to go and return from the mines, and he would have the best season for so doing. One more remark. The private correspondence from Mr. White to Mr. P. Pittar was interesting, but it would no doubt be doubly so to a shareholder to read the letter of communication as between both parties. I must here endorse the opinion Mr. Palmer has expressed as to where the line is to be drawn in that respect as between Mr. Pittar and himself in corresponding with the manager. His correspondence from Mr. White came through the directorate. I noticed in the last letter from Mr. White to Mr. Palmer that he thanked him for not seeking for information that ought only to be received by the directors, and his thanks to Mr. Palmer for the suggestions he had thrown out as regarded the operations at the mine.

4, Old Market, Bristol,

S. K. SCHROER.

CHONTALES MINING COMPANY.

SIR,—Your remarks on the Chontales meeting are very concise and clear, and as a shareholder from the commencement of operations I have often had to read of gross mismanagement, that now the concern appears to be in a crippled state, and I should have thought the directors would have been glad to have had the assistance of any respectable business man, but instead of that they ignore a gentleman who is willing to give his time and assistance for the benefit of all concerned, but the present directors for some personal feeling against the gentleman who proposes him; although nothing to say personally against the gentleman proposed, yet they object to have the assistance of this business man, and represent him to be the nominee of the proposer, who appears to have taken a great interest in the welfare of the mine. I cannot but consider the directors highly reprehensible, and it carries a feeling of more importance against the appointment than appears on the surface, and the sooner they are weeded or dismissed the better if they can to the prejudice of the shareholders carry on such animosities to this length. Surely the poor shareholders like myself, who have never got one shilling of interest for the past ten years, and the capital frittered away by much mismanagement, have reason to complain of the action of the present directors.—*Harrogate, Dec. 16.*

THOS. KIRKBY.

MINING IN IRELAND—No. I.

CONVERSATION BETWEEN A FATHER AND SON.

FATHER.—Do you still speculate in mining, John? for if so, I hope you will be very careful in your selection of mines; it may also be well for you to consult your friends even in small matters, and then you cannot be far wrong.

SON.—I have taken some shares in Irish mines of late father, as I heard you say there were some good speculations in Ireland. As to returns from mining stock, you well know the past two years have been dead against mining in every country, but I hope the present improvement in trade will assume something like a permanency, and then I have no fear for profitable results arising from my transactions in home mining at least.

FATHER.—You do not call Ireland abroad, I hope. I have had some experience in that section of the kingdom, and I shall be happy to tell you all I know, as well as to refer you to some good authorities on the mineral resources of the country. By the way, have you seen a copy of Dr. Kane's *Industrial Resources of Ireland*?

SON.—I have not, father.

FATHER.—Then I will combine the information given by him with my own personal knowledge gained during many years explorations in various Irish mining districts, but I can only enter into the matter in part this evening, so that it will be necessary for you to call on me on two or three occasions, that I may inform you as fully as possible.

SON.—I will do even so, father; but kindly tell me all you can this evening.

FATHER.—It would be superfluous, of course, for me to say that the facilities for mining in Ireland cannot be surpassed by those of any other country. Its seaboard is extensive; its harbours, bays, and inlets are large, safe, and may be counted by hundreds; its rivers are large in like manner, and in some instances navigable a considerable distance inland; and its railway system is now considerable, besides the country is everywhere intersected by good roads. You have, therefore, in Ireland a very favourable subject for mining enterprise especially; labour, too, is abundant and very cheap, and the climate so mild as never to interfere with mining operations.

SON.—Excuse me, father, do I understand that skilled labour is cheap in the mining districts of Ireland? as I was under the impression that Cornish labour had to be imported at considerable expense, and Jones tells me the men employed at our mines get 4s. to 5s. a day.

FATHER.—Cornishmen are often employed as agents, pitmen, and even miners, but the Irish miners are not inferior to any others for most practical purposes, and their maximum wages do not exceed 2s. 6d. per day, while the minimum in some districts is as low as 1s. 6d. per day, and I have myself employed there hundreds at the latter figure; in fact, I have employed even Cornish miners there at 2s. 6d. per day, and I know of some now employed at the same rate of wages in the south-west of Ireland. Of course, if you go to Ireland, or any other country, and work mines for philanthropic purposes, you are at liberty to give miners any wages you see fit, but I am simply stating the real state of the labour market, and what men will gladly work for in any part of the country.

SON.—Thank you, father. I am glad, thus far, to receive so favourable an account of the country, and am quite anxious to hear you enter into the capabilities of the several mining districts you promised to speak of in producing coal, iron, copper and lead ores in anything like paying quantities, as you well know that is the end and aim of all legitimate mining to find and work remunerative mines.

FATHER.—Quite so, John, but without explorations it is difficult to distinguish the good from the bad, as indications are often deceptive. I will commence with an account of the coal fields of Ireland, and later on we will speak of the metalliferous mines. Dr. Kane writes of them as follows :—

The coal formation of Ireland consists of a series of sandstone and slaty rocks, which rest on the upper limestone, and give an aspect of considerable elevation to the districts. They are seven in number; of these one is in Leinster, two in Munster, three in Ulster, and one in Connaught. These districts differ materially in their produce according as they are situated to the north or south of Dublin; those to the north yield bituminous or flaming coal, those to the south yield only stone coal or anthracite, which burns without flame.

We will commence the history of our coal districts with that of Leinster. This deposit occupies the greater portion of the county of Kilkenny, of the Queen's county, and of Carlow, it is bounded on the east, west, and south by two great rivers, the Barrow and the Nore, which run immediately at the base of the Colliery Hills. This district constitutes a great mineral basin, its strata consequently incline from the edge to the centre, the undermost appearing on the outer edge, and the uppermost in the interior of the district. The strata consist of beds of slate-clay containing abundant thin veins and nodules of ironstone, compact

sandstone, and sandstone slate; with these are interposed beds of fire-clay, and the coal beds, of which there are altogether eight workable, arranged in regular succession, the roof of the coal bed is sometimes sandstone and sometimes slaty clay. The floor of the bed is generally a clay, termed a coal seat. This substance is soft and earthy, and is equal to the best Stourbridge clay for all the purposes for which that substance is employed. The beds of coal in the Leinster district are, as already stated, eight in number, distinguished by the following names, arranged in order of their position from below upwards :—

- 1.—The Rosmore Foot coal.
- 2.—The first bed of Slate coal.
- 3.—The second bed of Slate coal.
- 4.—The Four-foot coal.
- 5.—The second Foot coal, or Drummagh coal.
- 6.—The first Three-foot coal.
- 7.—The double seam.
- 8.—The second Three-foot coal.

The seventh and eighth beds being those lying next the surface and earliest worked have been exhausted; the sixth bed, or Three-foot coal, which for the last century has principally supplied the wants of the surrounding country is now considered by Mr. Griffiths as nearly worked out. The inferior beds have been but little some not at all touched, and must be the theatre of future mining operations. Of these the most important is the Four-foot coal, and its description will serve as an example of the rest. The upper part of this bed is composed of 5 ft. 5 in. of slaty coal (locally termed kelves), under which there are 3 ft. of hard coal, containing some sulphur pyrites, then a bed of black slate-clay, 5 in. thick, and lastly 1 ft. of coal, containing a thin bed of kelve at the bottom, making altogether a height of coal, kelve and clay of 10 ft., of which but 4 ft. are solid coal. Mr. Griffiths estimates the area occupied by this coal at 5000 acres (Irish), and as its specific gravity is 1.591, the total quantity of solid coal may be calculated as rather more than 63 millions of tons. On the average this bed appears to lie about 140 yards below the surface.

And although this account dates more than 30 years ago, and a little has been doing from time to time since, I am of opinion there is much profitable employment in this locality for a great many years to come, as it will certainly pay better to supply the surrounding districts from this coal field than to import coal from this side the Channel. At our next meeting I will speak of the other coal districts of Ireland. Good-bye for the present.

SON.—I have carefully taken notes, and will ask the Editor of the *Mining Journal* if he will kindly publish them.

New Cross, London, Dec. 17.

THE MINING INTERESTS OF GREAT BRITAIN FOR THE YEAR 1879—No. I.

SIR,—The year 1879 opened with extreme depression, and even gloomier prospects, to the British miner, and for every department of British mining. Coal and iron were at a low ebb, strikes and lock-outs had crippled those industries, and discontent and distrust prevailed throughout. Tin, copper, spelter, and lead at the opening of the year were quoted at 70s., 64s., 15s., and 14s. In June last the prices of these metals were—Tin, 65s.; copper, 60s. 10s.; spelter, 16s.; and lead, 13s. The prices now are—Tin, 98s.; copper, 70s.; spelter, 19s.; and lead, 18s. the ton—a rise of 62s., 16s., 18s., and 40 per cent. in six months in the values of the several metals. Thus the future of mining industries assumes a far brighter aspect, while despondency and all but actual despair a few months ago are changed into hopeful promise, and keen competition to secure shares in most of our large producing mines, and those also of a promising character, that exhibit unmistakable signs of vitality and prospective expansion. As for instance, Carn Brea, Devon Great Consols, Dolcoath, East Pool, Great Laxey, Leadhills, Roman Gravel, South Caradon, South Condurow, South Frances, Tankerville, Tincroft, Van, Wheal Eliza Consols, and Wheal Pevor. These are 15 of the most valuable established mines dealt in upon the London market, but it is our opinion that the rapid rise in prices of shares teaches caution to investors, as Carn Brea has paid no dividend since February, 1874, while calls under the present management have been 41,375l., against dividends of 34,000l. in the aggregate. It is true that this mine paid 274,000l. on 15,000l. capital, but this was over a series of 25 to 30 years, dating from 1856, when the mine was cut rich under the practical control of the late Joseph Lyle. Had this mine been abandoned some 15 years ago the shareholders would have been advantaged, for no good has resulted to anyone save landlords, merchants, agents, bankers, and labourers. In fact, this mine, like Cook's Kitchen, and many another at work in Cornwall, benefit only what is denominated the vested interests of Cornwall. East Pool shares have risen from 9s. to 22s. a share, 9s. 9d. called up. This mine has paid in 42 years dividends of 16s. 15s. 3d. a share, say 8s. a year on an average. Just compare this mine with Wheal Pevor, selling for 54,000l.; South Condurow, 77,500l.; West Tolgus, 10,000l. to 12,000l.; and Mellanear, 40,000l. The Van has proved an important prize, and has declared in dividends 360,000l. This mine has proved of value chiefly to the original subscribers, who have pocketed some 450 per cent. in dividends, and the property is still marketable at 400 per cent. premium, but it is a question for investors to determine whether or no the property be worth 375,000l. to purchase. At one time these shares, 4s. 5s. called up, sold at 84s. to 86s. each, three and a half fold the aggregate dividends declared, and close on twofold the entire dividends and the present market value of shares. This mine, paying 5s. dividends quarterly, even if doubled in amount through advanced prices for lead and blende, cannot be worth 24 years' purchase on present dividends.

All mines upon discoveries being made rise rapidly in market value, as for example South Caradon (25s. paid) up to 460s. a share, Devon Great Consols (20s. paid) rose to 800s. a share, East Pool (5s. called up) 525s. a share, East Rose (50s. called up), 1750s. a share, Tresavean (32s. 10s.) 2700s. a share. Thus it is evident that large gains ensue in most instances to original shareholders, as have recently been established at Wheal Pevor, Wheal Eliza, West Pately Bridge, and likely to follow at Illogan Mine Company, Wheal Cledd, Lady Ashburton, East Eliza, East Crebor, West Caradon, and Croadock Moor; Pant-y-Gwladod, Prince of Wales, Lead Era, Bodidris, and West Wheal Seton. West Basset and South Frances, formerly very rich and profitable copper mines, but for some years worked at the expense of periodical calls, are again likely to become established dividend properties—in fact, South Frances is at this time one of the best tin-paying mines in Cornwall. We beg to subjoin a few remarks in respect to the mines in which we feel an interest from inherent worth, and likely hereafter to occupy prominent positions in public recognition, based on established merits. The Dolcoath Mine—once famous for its yield of copper and now of tin—we wrote in the spring of the year, 1870, "Is a prize of a century's growth, and notwithstanding the wear and tear of ages, is as firm, vigorous, and expansive as ever. The spring and elasticity of manhood is still discernible, and the existing company, at the age of 63, is as full of prospective promise as ever; the two monthly dividends are 3s. per 1432nd share (say) 18s. annually, equal to 14s. 8s. per cent. on market value of 125s. a share. The reserves are computed at 800,000l. or 1,000,000l., and the deeper the works are explored the larger are the returns, and at existing prices of metals profits will augment rather than decrease. It should be observed that the price of tin, March, 1870, was 127s. a ton, and the dividends amounted to 25,776s. a year on a market value of 181,500l. The shares were subsequently multiplied by three, and thus became 4296, and the price ranged to 90s., 95s. a share, equal to 386,640s., an advance of over 100 per cent. For the year 1872 the dividends were 45,645s., and the future of the property was all *couleur de rose*, but the subsequent discoveries of tin in Australia upset the brilliant prospects of Cornish tin mining, and the price of the metal continued to fall from 150s. to 52s. a ton, and as a matter of course mining enterprises suffered from corresponding depression. Hence Dolcoath shares fell to 20s. each just six months ago. The improvement in trade, and increased demand for the metal has raised the price to 95s. and 96s. a ton, while the price of shares has advanced to 55s., or (say) 54,480s. above the market value a decade ago. During these ten years the dividends have been 156,177s., the last dividend being 10s. a share, equal to 3s. per cent. on current market value. The output is very large, the average dividends throughout the past decade have, therefore, been 15,671s. 3s. 7d. per annum, the discharge greatly improved, improved machinery introduced, and economies observed that a few years ago were unknown in Cornish mining. There can be no question if ruling prices of tin be maintained throughout the coming year that gain and dividends will be doubled at least, but even then the price of shares is high enough.

Wheal United is attracting very just and advancing attention, founded on actual discoveries, coupled with inherent prospective promise. This mine is on the apex of the mountain range, but traverses a ravine that presents great facilities for development, and the erection of dressing-floors and machinery for dressing works wholly

by water-power. Stone-breakers, rock-drills, and every modern improved machine for economical returns have been introduced; and as ample working capital is subscribed, there is every evidence of a brilliant future for this property.

R. TREDINNICK,
Consulting Mining Engineer.

BORING MACHINERY—ROCK DRILLS.

SIR.—Reading your valuable Journal from time to time I have seen mine agents, managers, shareholders, and so-called theorists spouting at account-house meetings of the great lessons which adverse times had taught them; that they could return tin at a much less price and get a considerable profit even if they sold their tin at a price which formerly entailed a heavy loss. Well, it may be so. I am sceptical on this matter, and would rather attribute the result to the higher percentage of tinstone, reduced price of materials, and more labour done for the money, resulting from general depression and greater necessity to do more work. Where are the improvements? I read the Journal and see a meeting has been called by a land surveyor of a neighbouring town, and the cute managers—ever supposed to be on the alert for their own interests, especially when large shareholders attend and expatiate on the advantages of boring machinery. The promoter of the scheme finds he cannot carry on in his private capacity such a heavy undertaking, and suggests a limited company. In other words, a theorist tells mine managers how to open their ground faster; nay, they even give him about 20 per cent. more than they will their own men, or 40 per cent. more than they could do it for themselves, by putting up efficient plant and saving coal. Is this the result of starving times and depression? Have mine agents so deteriorated that outside assistance is essential to their existence in their own field of labour; are constant application and attention to detail so foreign to a miner's habits that the mechanic who never was 6 ft. below the surface of the earth must direct and keep in action the power of their existence? As to the scheme itself—a limited company—the result will prove no exception to our experience of limited companies in the West—a total loss of the capital, and this may be its limit. If boring machines are to work, who ought to work them but the shareholders themselves by erecting proper plant which no limited company would do, owing to the uncertainty of their contracts or profit to be made. It is said one large compressor should supply four mines; in other words, store air as you store water, that all may draw from it. Carn Brea would never accuse East Pool of keeping their taps open, or South Crofty accuse Tincroft of not using their portion. Chimerical in the extreme—account for its existence as one may—in an effort to get out of an unprofitable business, or unwillingness in those most interested to apply their whole minds to a given object.

I shall wait a little longer before I join in the pean of exultation that out of adversity we have become wiser men, for anything more incredulous or cowardly in facing not a difficulty, but a new thing essential to the elevation of the working miner and better dividends has never come under my notice amongst a collective body.

Tabb's Hotel, Dec. 16.

COUSIN JACK.

THE DISCOVERY OF TIN IN ROCHE.

SIR.—The discovery referred to in last week's Journal is in the parish of St. Austell (not Roche), in a mine called Rocks, in the vicinity of an old mine of the same name, whence very large quantities of tin were formerly returned. The "discovery" now agitating the public mind is on a lode 70 fms. south from the Rocks lode, and parallel with it; it was intersected at a depth of 5 fms. from surface by a trial shaft, from the bottom of which a cross-cut has been put through the lode, which is 24 ft. wide in that place. There are about 40 tons of tinstone lying near the shaft at surface, which yields on an average about 60 lbs. of black tin per ton of stuff, which is much beyond the yield in most mines. A stone out of the heap was sent to the assayer at Trethellan Smelting House, Truro, which was found to be worth 47l. 5s. per ton in the stone; of course, that was a very rare specimen. The two samples taken in my presence yesterday yielded at least one-tenth of black tin. I understand that the promoters intend to erect a pumping and a stamping engine, and I am sure that they are warranted in so doing even if no other lode than the one so recently discovered existed in the sett, but there are several others, so the miners say. This discovery of tin has given some encouragement to the miners of the district, who are in hopes that a good amount of work will be supplied to them, many of whom have little or nothing to do for a living.

A letter in last week's *Mining Journal*, subscribed by "One who Knows," is the product evidently of some one who desires to injure Capt. D. Cock, the manager of Rocks Mine; otherwise, I apprehend he would not have stated the falsehoods therein contained. He says in his letter that he was there subsequent to Dec. 6, which I am authorised to state was not the case, because the miners have been there constantly day and night, and they allege that no person had visited the place and taken samples of the tinstone. That being so, your readers will know what weight to attach to his pretended assays. The writer might well be ashamed to put his name to a letter exhibiting an animus so discreditable to his heart as a neighbour. He referred to Capt. Cock's forthcoming book. What has that to do with the mine? He also spoke of the felparg works, with which Capt. Cock has no connection, and never had. Those insinuations only evidence the wickedness of the writer.—Truro, Dec. 16.

R. SYMONS.

THE GREAT DISCOVERY OF TIN AT BUGLE, NEAR ROCHE.

SIR.—Although much has been said and written relative to the above discovery, it has been done with so much indefiniteness and deficiency of detail as simply to introduce the reader or hearer into an atmosphere of wonderment without at all satisfying him on points essentially vital. This, however, under the circumstances, is not to be wondered at. The ratio of supply to demand in the labour market of late has been very great, and anything that promises permanently to change this state of affairs is sure to be hailed by the working classes as well as philanthropists in general as a godsend. People had grown so accustomed to having successful mining in Cornwall spoken of as a thing of the past that when fact had given the lie to this foregone conclusion, they found it next to impossible to give a sober and circumstantial account of the matter. After all this it is refreshing to be able to descend from the aerial flights of sensationalism into the calm and sober regions of positive fact.

Taking as comprehensive a view of the matter as is possible under the circumstances, the following observations are given as the result of an inspection made on the spot on a recent date. The lode is a rake vein of gigantic dimensions, having a general direction of nearly east and west, with an incline or underlie of about 2 ft. in the fathom towards the north. These characteristics, taken as indicating age and productiveness, place this lode in the category of the oldest and most productive of mineral veins from a geological point of view. Although a cross-cut has been driven to the extent of 4 fms., the southern wall of the lode has not been reached. There are, however, I think, positive indications that it is near. The cheek or wall that has already been exposed is beautifully defined, and the nature of the rock in general is wonderfully consistent. The matrix of the ore is formed of schist and quartz. The rock is moderately hard, and the metal is distributed about equally through it—that is, it is not bunched, although of course it must not be understood that all stones obtained from it contain the same percentage of tin. I have a stone before me now which, from its specific gravity and appearance under the microscope, I judge to contain from 75 to 80 per cent. of pure metal. Some portions of it are beautifully crystallised, and others are thickly impregnated with tin of a very fine grain. This lode possesses unmistakable evidences of strength and continuity, both in its mineralogical structure and superficial appearances. It is, as stated before, very large at present, but I shall be much mistaken if the subjacent parts of it do not decrease in size, and perhaps increase in richness in the same proportion, which, from all economical considerations, will be a change not at all undesirable. It is nearly parallel to the old Rocks lode, and about 100 fms. south of it, so that if thought desirable both lodes might be worked from the same permanent shaft. I should like an opportunity for a minute survey of these lodes, as I

think them well worth studying, and have an idea that there is more in connection with them than has yet been suspected.

The real commercial value of the lode cannot be easily estimated. A sample of it sent to the assayer has been reported by him to be worth 47l. 5s. per ton as it stands in the rock. This is an evidence of its richness worthy of particular consideration. There is a vast amount of ore to be obtained from this lode, and the question of getting it from there is not one of difficult solution. A lode so rich, so large, and so near the surface is an occurrence very rare in this country.

It is a true saying that "History repeats itself." Large fortunes have been amassed in connection with mining in Cornwall. Let us hope that this discovery is an earnest that history will repeat itself in this case in the same manner. As things stand at present there cannot be two opinions about this matter. It is beyond controversy one of the most fortunate discoveries that has been made for many years. I know of but one mine in Cornwall that bears a complete analogy to it, and that has been extensively worked, and at a very large profit. If the analogy is not quite complete, the only particular in which it fails is that this lode is much nearer the surface, which is a consideration not easily estimated in mining. The lode will certainly require blasting, but taking into consideration its size, the nature of the rock or "country" in which the vein occurs, and the present improved state of explosives used in mining, it is certain that vast quantities of the ore can be raised at a very easy rate.

ONE WHO KNOWS, AND HAS SEEN FOR HIMSELF.

THE DISCOVERY OF TIN IN ROCHE.

SIR.—In replying to the communication of "One who Knows" (?), as published in last week's Journal, I shall not trouble myself to defend the merits of the discovery alluded to in it—"facts are stubborn things," and must be allowed to speak for themselves. The first thing that strikes one who really knows is the utter want of truth and honesty that pervades the whole article. Whoever "One who Knows" (?) may be, he is evidently one who does not care for the truth if some baser motive can be served by some baser method. Anyone who will carefully read the letter through will see *prima facie* evidence of this. The writer styles himself "One who Knows," and yet he admits that his information comes from some other parties that visited the mine for the purpose of testing the merits of the discovery. He states that his informants selected the best parts of the tinstuff lying on the surface, and after vanning could scarcely produce evidence of the presence of tin. A sufficient answer to this is found in the report of the assayer, who has reported that a sample of the lode tested by him is worth 47l. 5s. per ton as it stands, according to the present standard of tin. The stone so tested was sent as it was taken from the lode, and consequently could not be better than the best.

But the most objectionable fact connected with the letter is that it is a most deliberate falsehood. After careful enquiry I have ascertained that no such visit has ever taken place—absolutely never. Besides the despicable meanness that so fully pervades the statements relating to the discovery itself, there is an overt allusion to "a mountain of felparg," with a covert insinuation that it is somehow connected with me, when the truth is that I know simply nothing about it, and could not say whether it has turned out a failure or not.

An analysis of the letter referred to presents the following facts:—1. The so-called information of the writer is admittedly derived from others, therefore he has stooped to the consummate meanness of publishing statements the truth of which he could not himself vouch for.—2. The so-called visit never took place, therefore the whole matter is a malicious fabrication.—3. He allows it to be inferred (1) that there is something dishonourable connected with the "mountain of felparg," and (2), as would be expected from the above, he had not the honesty to state that the two mines mentioned in his letter have not the least connection with each other, but makes this allusion a kind of side thrust in the dark at me. I must say that an act of such incomparable meanness has never before come under my notice, and if I were given to passionate expressions I should feel quite justified in stigmatising the writer as a malicious and cowardly liar.

Roche, St. Austell, Dec. 16.

DAVID COCK.

ROCK'S TIN MINE (BUGLE).

SIR.—Your correspondent, "One who Knows," in last week's Journal, is in great error—that is to say, if he really mean his assertions to be taken as other than a very foolish and unwarrantable jest; and I should think he would be better suited for any other occupation than a mining critic or a correspondent to such a valuable journal as yours. In the first place, I may say that within the past fortnight the mine has been visited by several highly respectable gentlemen who understand tin and the mining of it as well—and I guess much better—than the writer who tells us the outrageous falsehood that there have been practical men on the ground who have sampled the lodestuff, and found the produce to be only 2 lbs. to 3 lbs. of tin to the ton.

There are at present 18 men employed on the trial of this lode, which is proved to be 24 ft. wide; and those men who are engaged from one o'clock Monday morning until ten o'clock Saturday night will bear me out on oath, if necessary—that no one has been on the mine and tested the tinstuff except in the presence of the agents; and I do not hesitate to affirm that all the stuff that has been tested has proved to yield as many hundred pounds of tin to the ton as your correspondent says single pounds, which, as your readers will admit, is an important and evidently not an accidental difference. I visit the mine every day, and can fully confirm every statement I make.—St. Austell, Dec. 18.

SAMUEL R. COCK.

SOUTH WHEEL FRANCES.

SIR.—I am pleased to inform you and the shareholders generally that the mine continues to look well, quite as well as reported at the last meeting. The correspondent referred to by Messrs. Watson Brothers has no interest in this mine, and his remarks are a tissue of falsehoods from beginning to end. Messrs. Watson Brothers, too, are not shareholders in this mine, and their remarks respecting the position of it are unfair, and I say that, notwithstanding the work we have to perform, the position of the mine is second to that of no other mine in Cornwall. All labour cost due and charged is paid, and everything paid is charged in the accounts presented to the adventurers at the last meeting, and we have ample funds in hand to carry out the work contemplated for the next six months. We have now communicated the rise in the back of the 170 to a cross-cut in the 154, and thus ensured a most complete ventilation of this part of the mine.—Redruth, Dec. 17.

A. T. JAMES.

SOUTH FRANCES MINE.

SIR.—The statements made by "A Practical Investor," in the Supplement to last week's Journal, in reference to this mine, are so much exaggerated beyond the bounds of reason, truth, and common sense that they could only be made by one who is evidently mentally afflicted. There may be others bordering on the same complaint; but, instead of allowing the public to see their condition by making violent and outrageous statements they might be under the impression they should sacrifice their property to satisfy the covetousness of a certain class who are ever longing to feast on the honest earnings of hard-working and industrious men. If any such should be amongst the shareholders in South Frances I would advise them before carrying their impression into effect to carefully read and compare the letter of "A Practical Investor" with the agent's report, published at the same time. The former says the water is in the bottom of the mine. The latter says the shaft is sinking below the 215, by nine men, in a lode worth 30l. per fathom. The former says six new engines are wanted, three of which must be pumping engines. The latter says "the present engine will pump all the water with little or no difficulty, and no other pumping engine will be required for many years to come—if, indeed, for ever." The former says 25,000l. must be spent in machinery, repairs, &c., to put the mine in a good position; but the latter, to whom the shareholders have to trust for the fullest information respecting their property, says nothing of the kind, any more that it will be necessary to have one winding and pumping engine more than they have already got, and this will be for the new shaft. "A Practical Investor" says "the rich reserves in one part of the mine are almost exhausted, and there the eyes have been dug out;" and yet in another place he states

that the present 48 heads of stamps, which hitherto have been sufficient to treat all the ore in the mine, whether low or high grade, will in future be scarcely adequate to cope with anything but the high grade, because of the large quantities of this grade to come. If the extra 25,000l. be spent in machinery, &c., in the next 2½ years "A Practical Investor" says that with the present returns four-monthly dividends of 13s. 4d. a share during that time can be paid, which means 20 per cent. per annum on the present price of 10l. per share. If the price of shares should advance to 15l. it would be 15 per cent. on the purchase-money. But this "Practical Investor" (I allude to this *nom de plume* with feelings of the greatest sympathy for the person who has used it) has recommended an additional 100 heads of stamps, which, as a matter of course, would treble the profits at least, which would pay 60 per cent. a year on present price of shares, or 30 per cent. a year if the price of the shares should advance to 30l. each.

C. W. SECORMBE.

THE CORNWALL GREAT CONSOLS.

SIR.—In a pamphlet "Inviting share investments in a concern entitled 'Cornwall Great Consols,'" and professing to give a report of the inauguration meeting held Oct. 30, 1879, at Golding's Hotel, Callington, Prof. Owen, F.G.S., is stated to have attended the meeting. It is further stated that "the Bristol shareholders had provided themselves with independent professional advice in the person of Prof. Owen, F.G.S." (p. 6); also, that "with the light of his vast experience he gave a very elaborate description of the geological features of the property" (p. 15).

Of the Fellows of the Geological Society of London entitled, as such, to the initials F.G.S., I am the only one of the name of Owen; I, therefore, on my own account, and in the interest of those into whose hands the pamphlet may have fallen, beg to state that I was not present, as alleged, at "the inauguration meeting of the Cornwall Great Consols," and have not given a description of the geological features of the property, the name and existence of which I knew not until a copy of the pamphlet, issued apparently by Bishop, Earle, and Co., Mining Agents, Bristol, was sent to me by my friend Prof. Warrington W. Smyth, F.G.S., of the School of Mines, Jermyn-street.—British Museum, Dec. 15.

RICHARD OWEN.

* Fry Brothers, printers, Broad Quay, Bristol.

GREAT CORNWALL CONSOLS.

SIR.—A pamphlet, issued by Messrs. Bishop, Earle, and Co., of Bristol, having been shown to me, and in which I find I am referred to as having reported on the above property, I request you will be good enough to insert this letter to intimate to whom it may concern that I have not made any report on the mine. I was applied to to inspect, but declined doing so for reasons I do not care to explain here. My solicitor has written to Messrs. Bishop, Earle, and Co. to withdraw what is represented to be my report from the pamphlet; but, having received no reply from them, I beg the favour of your publishing this communication.

R. GOLDSWORTHY.

Bedford United, Tavistock, Dec. 17.

MINING IN CARDIGANSHIRE.

SIR.—The letter on mining in Cardiganshire, in which the merits of various properties are shown, as also the position this county occupied over two centuries ago, speaks well for the future. As an example of the renewed life, the Bwlch United Mines shares have risen to a substantial premium, showing the estimation in which the property is held by the investing public under its present able management. In my opinion, large returns of ore will be made with the accruing profit. The shares are held firmly for investment by responsible individuals, who know the riches of the mine, and not for speculative purposes. It may be as well to state here that 12s. 6d. per share has only been called up of the first issue. The explanation is simple—the holders being persons of standing and repute, and the funds in hand being sufficient, it has not been deemed prudent to call up the balance of 7s. 6d. per share until it is required.

This, to business men, will demonstrate the financial security of this company, and increase the value of its shares, irrespective of the intrinsic value of the property; this company is, therefore, so to speak, out of the realms of speculation. It has a good balance with no liabilities, an actual reserve, in addition to the permanent one. With such facilities—stopes in full play, three levels being driven, and the sinking about being resumed—I for one have no fear of the result. This mine can stand on its own merits. The capital, though relatively small, is still powerful for development. No promotion money was paid, and every advantage is being taken of the heavy expenditure incurred by its predecessors.

SHAREHOLDER.

COPPER IN CARDIGANSHIRE AND MONTGOMERYSHIRE.

SIR.—I read your correspondent's letter, signed "Ceredigion," in last week's Journal, with considerable interest, as I have frequently of late been questioned as to the existence of copper lodes in the formation usually known as the Silurian. Although large beds of grit are found in the clay-slate of Cardiganshire and Montgomeryshire, the deposits of copper seem not in any way affected by them, for in several lead lodes of the district, which run through beautiful blue killas, copper is found; in some others the killas gives place to a dark schist, but in any of the numerous places where copper is worked it appears to be in lodes of the usual character—true fissure veins, filled with splendid gossan and large quantities of pyrites.

The Cambrian lode at Esgair-fraith is unquestionably one of the main lodes running through Cardiganshire and Montgomeryshire, and may astonish the coming generation by as large an output of copper as that which astonished people at the close of the last century from the great deposits discovered in Parys Mountain in Anglesea. This lode in the Dylife Mines was found to contain copper, and a parallel lode in Glaslyn, to the north-east, is an equally promising lode for copper. Not only on the north, but also right across this belt of mineral ground, embracing Plynlimmon to the borders of Radnorshire, are deposits of copper found, and the question I would like answered by some of your correspondents is, why the change from tin to copper, or copper to tin (such as is found in the mines of Cornwall—take Dolcoath for instance), should not equally apply to the champion lodes of the district.

May it not some day be found, when greater depths are attained at South Darren, that more copper and less lead shall be discovered? It is continually noticed by miners that the presence of blende is indicative of other metals, and yet in the Rheidol Mines at sea level with 100 fms. of backs, the lodes are full of blende, with little lead. It cannot fail to interest parties investing in the mines of this and other districts if those agents who have had to deal with the various metals—lead, copper, and blende—when combined in fissure veins were to state if any general law or sequence is noticed. I, for one, shall be obliged, for the Blaen Caelan Mines, in which I am interested, contain the Cambrian lodes, and one of them is, to all intents and purposes, a copper lode, copper ore worth more than 20l. per ton being found near surface, and the masses of gossan and ribs of mundie extend to 3 or 4 yards wide, and hold about 50 fms. from surface. The copper ore has not, however, been worked by the late Blaen Caelan Company nor by the present Blaen Caelan United Mines Company, they having hitherto been confining their operations to the lead lode alone; but with such evidence of copper at Esgair-fraith it would seem that a valuable source of wealth exists, which is hardly appreciated, as I have often found the greatest scepticism expressed, and nothing but the monthly sales by the Cambrian Company have moved them to seriously believe in the existence of paying copper mines in Cardiganshire.

JONATHAN PELL.

Aberystwith, Dec. 17.

HOLLOWAY'S OINTMENT AND PILLS combine both sanative and powerful in a high degree—the former term is understood their ability to preserve health, by the latter their capability to restore health. With these remedies at hand, no invalid need be at fault to guide himself or herself safely through the many trials to which every one is subjected during our long and oftentimes inclement winters. Coughs, colds, ulcerated throats, quinsy, whooping cough, can be successfully treated by well rubbing this ointment upon the chest, and by taking the pills. During damp, foggy weather asthmatical sufferers will experience the utmost possible relief from the friction of the ointment, and all tender-hearted persons will save endless misery by adopting this treatment.

Meetings of Public Companies.

ST. JOHN DEL REY MINING COMPANY.

The half-yearly meeting of proprietors was held at the Cannon-street Hotel, on Wednesday.

Mr. JOHN HOCKIN (the Chairman) in the chair.

The CHAIRMAN commenced the proceedings by reading the notice calling the meeting. The minutes of the last meeting were read and approved. The report and accounts were taken as read.

The CHAIRMAN said: Gentlemen,—This being the half-yearly, or interim, meeting, we do not give you the accounts in full detail or the detailed reports of the work performed at the mines as at the close of the financial year in June, but in the report just presented to the proprietors they will have found a brief summary of both, which we hope will have been considered, on the whole, satisfactory. The profit for the six months enables us, after providing for all the expenses of the half-year, to propose the same dividend as was last paid, and to carry forward a larger balance by £2600, than was brought from last year's account, so we have fairly earned the dividend, with the usual 10 per cent. to the reserve fund, and something to share. The work at the mines has been on about the same scale as during the preceding twelve months; the yield has been better to about the extent of the improvement in the recovery or increased saving of gold; the result is a larger produce than was obtained for the corresponding period of last year, though the output was less by 3500 tons. The chief cause of the smaller haulage is the want of the permanent hauling machinery, referred to at page 8 of the report, and until it is complete we can hardly hope for an increased output. Not only does the want of this machinery prevent a large haulage of mineral from the mine, but it prevents our obtaining the same number of native miners as we should if they could be saved the labour of climbing the ladder and be brought up by machinery, and seeing that it will take ten months to put in the machinery and get it into working order, the directors have consented to the erection of a man-engine as a temporary measure. Considerable progress had been made in the erection of this engine, and the men were able to use it for a part of the depth when the last advices were dispatched. Great credit is due to the mine and mechanics' departments for the rapidity with which the work has been pushed forward. The same cause which has interfered with quarrying a large quantity of stone has also prevented exploratory work being carried on to the extent that is desirable, and we regret, more especially, that it has not been practicable to do more in sinking the B shaft, and in driving the western level, for we look upon these as most important for obtaining a knowledge of the resources of the mine in this interesting section of the workings. When this machinery is completed not only will it admit of larger haulage and a means of supplying more labour, but a great saving of materials, and the labour for working them up, will be effected. In regard thereto the Superintendent writes, in a letter just received:—"The work in connection with the permanent machinery belonging to the mechanics department is being pushed forward as rapidly as possible, and it is thought that the entire work will be completed in about 10 months. On the completion of that important work, to which our best efforts will be directed, a great reduction in the mechanics force can be made. In addition to the saving of labour the consumption of timber will be considerably reduced, for vast quantities of this material have been constantly required since the re-opening of the mine for shoots, drum-rollers, &c." I have said that the improved recovery of gold during the half year past increased the yield by about the additional amount saved. The mean of the two modes of showing the loss for the past half-year was 2.263 oits., or 5 dwts. 5.3 grs., per ton; the mean for the preceding half-year was 2.649 oits., or 6 dwts. 2.6 grs., per ton; the improved recovery was, therefore, .386 oits., or 0 dwts. 21.3 grs., per ton; whilst the improved yield was .285 oits. per ton, a fraction only less than the improved recovery. It must be borne in mind, however, that the latter is ascertained by assay of samples, and is, therefore, to some extent uncertain, whilst the former is an ascertained fact. We have no very clear evidence as to the cause of improvement in the recovery, nor are we assured of its permanency, for late results are not quite so good. It may arise from the strakes being in a better state of repair. Less sand was amalgamated by about 128 tons, and the recovery by second treatment, by arrastres, was only about 500 oits. for the half-year, or approximately .016 oits. per ton larger than during the preceding half-year. This recovery by re-treatment amounted, during the last three past years, to 8459, 8350, and 8853 oits. respectively, whilst the gold contents of the tailings by assay was 84,152, 79,809, and 74,867 oits. for the same period. The recovery by this second treatment may, therefore, be called, in round numbers, 10 per cent. only of the contents of the sand (2 to 2½ oits., or some 5 or 6 dwts. of gold, per ton), 9-10ths being at present lost. By inexpensive concentrating machinery we have ascertained that this refuse sand can be brought up to a rich sand, containing from 1 to 2 ozs. of gold per ton, yet the means of successfully treating this rich sand has not been devised; this appears to us here a most important point in connection with the probable improved treatment with the Morro Velho ores—and we have the same difficulty foreshadowed in regard to the Cuibaba ores—for if we could treat successfully these tailings, instead of only getting out about 10 per cent. of their gold contents, most important results would follow, not the saving of additional gold alone, but the saving of some 100 per cent. of water power, and labour to a very large amount. The reduction officers are reported to have worked zealously in endeavouring to decrease the loss of gold in the first process of stamping and straking, but they do not appear sanguine of much further advance in this direction. Increasing the proportion of sand amalgamated should, we think, be tried. It, therefore, becomes the more important that renewed attention should be given to re-treatment of the tailings. Calculation on a scale which will ensure a practical result is about to be tried. At Cuibaba a small force of about 100 hands has been employed in extending the levels, quarrying, and stamping about 400 tons of mineral a month, and on preparatory works on the surface for extended operations. The yield hitherto has been low, but has improved of late to an extent that will more than cover the cost of extraction and treatment even on the present small scale of operations. These will be extended as soon as the machinery, now in course of shipment, is received and erected, and the deep level will be pushed on with all possible speed. The total expenditure on this estate had not up to the end of the half-year absorbed the amount of unexpended capital on which fund the purchase was charged, so that it has not been necessary as yet to avail of the vote taken at the last meeting for applying a portion of the uninvested reserve fund to capital expenditure. The total net outlay during the last half-year has, you will have seen, been only 112½, which should be deemed a very satisfactory result, considering the brief period since the lode was reached. We are much disappointed that we are unable on this occasion to report the final settlement of the 4 per cent. provincial tax question, which we had hoped to have done. We feel confident, however, after the admitted justice of our case by both the Prime Minister and the Minister of Finance—Councillors Sinimbu and Alfonso Celso—and the decisions in the company's favour by both the Council of State and the Committee of the Chamber of Deputies, that the matter has only been postponed to next session. On the subject of finance I need not say much. With the gold to arrive next month we shall have a surplus of cash in hand, after paying all liabilities up to the end of February, and providing for the amount due to the reserve fund—and that fund now amounts to a sum equal to any probable emergency. (Cheers.) These are the only remarks which occur to me to make upon the report, but I shall be happy to answer any question. I now move that the report which has been presented to the meeting be received and adopted.

Mr. S. E. ILLINGWORTH said that he was pleased to hear that the directors were giving their attention to the extraction and saving of the loss in the tailings. From the present report there seemed to be a steadily decreasing amount of loss in the process, which was an evidence that the officers were doing their best. In the last summer's report there were communications from both the reduction officers, both of which were very much to the point, and the one by Mr. Williamson was especially lucid and practical. Mr. Williamson divided the question of the saving of gold from the tailings into two heads, one being the concentration of the tailings to the highest point, and the other the question of getting the gold out of that con-

centration, and in the report Mr. Williamson expressed an opinion that the first of these results had been obtained principally by the use of buddies, by which the stuff had been highly concentrated; the second result was still in the future,—a calcining process—but it was not yet known what it would effect. He should like to know whether the buddies were still concentrating the ore, or whether they were waiting for the furnaces. With regard to getting the ore from the concentrated tailings, he believed it would resolve itself very much into two points.—The saving of the ore, and the saving of the tailings, and the saving of grinding and concentrating the tailings, but also for amalgamating them in the arrastres, and the second would be the object of not throwing any stuff away. He had looked over papers and reports from eminent men who had had great experience and success in working arrastres in other parts of South America, and he would read one or two of these extracts. The first was from Mr. de Rivero, director-general of Mines in Peru, afterwards Peruvian Minister in London, who stated as follows:—"We succeeded in extracting the gold from the ore by amalgamating in the arrastre at the same time that they are being ground, for which purpose the bottom of the arrastre is covered with mercury. Mr. de Rivero adds that such is the state of fineness to which the ore is reduced by the arrastre that a person who has only seen the action of stamps can form no idea of it, and by this process the gold, or by far the greatest part is acted on by the mercury. He includes in his list of ores treated in this way pyritic ores." The other was from Mr. Bousingault, a Member of the Institute of France:—"Mr. Bousingault's efforts at Marmato have been crowned with success. He has employed the Cornish type, and has reduced the loss in that process to 25 per cent. To extract the gold he has introduced the Mexican arrastre for grinding and amalgamating the concentrated ore in one operation. This has been found to be an answer, as the loss of 25 per cent. which had been sustained by washing in the batea is by the above method reduced to 3 per cent." He (Mr. Illingworth), therefore, urged that the question of putting up arrastres should be carefully considered. In a previous report Mr. Williamson mentioned that he had extracted gold from a very old and very poor heap of tailings, and after extracting the gold from it the loss by assay was as small as 8 per cent., and Mr. Williamson deduced from that that it was easier to get gold from very poor tailings than from better; but the opinion which he (Mr. Illingworth) deduced from it was that it was easier to get gold from old heaps than new, the action of the sun and air having disintegrated the ore and rendered it more easy to get the gold. It was important that the tailings should not be allowed to run into the river, but should be placed on a heap like waste was tipped at ironworks; the tailings thus placed in a heap would improve and become more tractable as time went on; and whenever gold was wanted it could be got from the tailings. He did not know why a time should not come when they would perfect a system of getting all the gold out of the ore, and then these old heaps would become a new mine to the company. (Hear, hear.)

Mr. ILLINGWORTH said as regards the ore he should like to see a transparent section of it, so they might be able to see under a microscope how the gold lay in the ore, and then they would know better how to get the gold from the ore. He wished the Chairman had spoken more fully about the calcining process, which really seemed corroborative of Mr. Illingworth's suggestion. There was a project which the Chairman had had something to do with—that sulphur should be its own fuel, and he asked whether that project was likely to come into practical use. He should also like to know whether the ore was reduced to sand or to powder, because if it was only reduced to sand the fine particles of gold might get lost in the sand, and the quicksilver could not touch it; but if it was reduced to powder they could get the gold out better. On the whole, he expressed his pleasure that the dividend remained the same.

The CHAIRMAN said he agreed with Mr. Illingworth that in South America, and also in Mexico, the arrastre was the only mode in which they got the gold out of the ore, and some time ago an arrastre was erected at Morro Velho, and an attempt was made to amalgamate the Morro Velho ore, but the whole thing was pronounced a failure. Why he could not say. It rested with the officers, and whether it required more than accustomed to the arrastre to use it he could not say. The directors had been told that the arrastre would be an improvement on the arrastre—the Californian pan, in which iron was made to grind upon iron, instead of stone upon stone; but this also turned out a failure, the action of the Morro Velho ore on the quicksilver being such that it flowed away with the water. The calcining had not been tried; the directors had no idea what effect it would have. It had been tried in the crucible on a small scale, but that would give no idea what the result would be if they were to calcine large quantities, and it would also become a question whether the cost for fuel would not be so large that it would not do to treat the ore in that way. As regards the grinding, great credit was due to the directors for the way in which they had proceeded. The ground could be made to pass through a sieve with 12,000 holes to the square inch; but even after that it still contained gold mixed with the iron pyrites. It had struck the directors that if they could get rid of the iron pyrites by disintegration by heat they would be able to get at something, but the company had not yet tried calcining on a practical scale, but they were determined to try that or some other process until they succeeded in obtaining a better result. As regards the Holway process, it was not yet in a state in which the directors could try it. Mr. Holway tried to get up a company and work it, but he was told it was not in a practical state; but the directors had an agreement with Mr. Holway that when he was in a position to work the St. John del Rey were entitled to take his patents on reasonable terms. The ore had been examined by a first-class metallurgist, who thought they were suited for the Holway process.

Mr. ILLINGWORTH (a director) said it was sufficiently clear to his mind why the arrastre failed. It was within his knowledge that in South America arrastres were used for amalgamating ores similar to those in Morro Velho, and they were reduced very much in the same way by stamps and concentrated, but the amalgamation part was always effected in the arrastres, and with perfect success. He had tables for two years relating to works which he had himself superintended, and the loss of gold was not more than from 3 to 5 per cent. No doubt the arrastre referred to by the Chairman had not been properly constructed; and, though in the Mexican arrastre the stones were not placed very close together, still for treating the Morro Velho ore he thought the stones should be well adjusted, and sufficiently hard to crush the material as well as amalgamate it. He believed that if more attention were given to the construction of the arrastre it would succeed.

Mr. TEBBINS, whilst fully admitting that good was frequently derived from these discussions, still hoped it would not go forth that the shareholders for a moment considered that the officers were not capable of carrying out the instructions of the board. (Hear, hear.) He would just mention that if Mr. Illingworth turned to pages 63 and 67 of last report he would see full reference to the Mexican arrastres, and also to the fact that the directors would not do such a foolish thing as to allow the tailings to run into the river. There was a large accumulation of tailings at the mine, which would one day be worked. The working of the arrastres had had the best attention of the directors and officers. He trusted they would try stamping with mercury, which had been found effective in South America, but not for pyrites, but for gold; in the Sierra Buta and Plumas Eureka, where they had a quantity of sulphates, they treated a great quantity every month. There was some difficulty in calcining the ore.

Mr. ILLINGWORTH said he should be sorry if it went forth that the shareholders were in any way dissatisfied with their officers. He knew the difficulty of obtaining gold from pyritic ore, and he believed the company was more successful than any other in so obtaining the gold.

The resolution for the adoption of the report and accounts was then put and carried.

The CHAIRMAN then declared a dividend of 12½ per cent. for the six months, payable on and after the 18th inst.

On the motion of Mr. JONES a vote of thanks was passed to the directors for their able management.—A vote of thanks was also passed to Mr. Pearson Morrison, the superintendent and the staff.

A special vote of thanks to the Chairman for his ability and courtesy in the chair closed the proceedings.

VIRNEBERG COPPER MINING COMPANY

The ordinary general meeting of shareholders was held at the offices of the company, Knight-riding-street, on Tuesday, Mr. Alderman HADLEY in the chair.

Mr. T. R. CLARKE (the secretary) read the notice convening the meeting. The directors' report and statement of accounts were taken as read.

The directors present the general balance-sheet to September 30, 1879, to which the profit and loss account for the financial year is appended. The year has been characterised by an unusually severe and prolonged winter, during which surface operations were almost entirely suspended; hence the erection of the buildings and machinery necessary to complete the new dressing-floors was greatly retarded, and the excessive rainfall of the summer tended in the same direction. The crushing mill, jigging machines, and buddle were, however, put to work in the course of the winter, and the great engine at the Hadley engine-shaft being continued, and it is hoped that early in the coming year it will be down to the 180 metre level; according to the underlie of the lode it will be intersected by the shaft at or about this point. Judging from the ground now being worked in the 120 and 140 metre levels, south from shaft, the prospects on driving the 160 metre level are most encouraging. The directors look forward with confidence to the result, and also to a further extension of the workings north of shaft which they contemplate. For more detailed information relative to the condition and prospects of the mine the directors refer to the manager's report to be presented to the meeting. They have much pleasure in again recording their confidence in Capt. Roskilly's management.

During the year the company have sold several parcels of copper ore, realising in the aggregate 5797½. 0s. 8d.; the average price per unit has been 10s. 11½, and the average produce 14½ per cent. by dry assay. A further parcel of ore raised during the year was sold on Oct. 14 for 1576½. 10s. 7d., averaging 13½ per cent. copper, and realising 12s. 3½d. per unit; and upwards of 300 tons are now on the way to Swansea. For this cargo the directors hope to obtain an advanced price. In consequence of the late completion of the new floors, and the inclement weather, which persisted for such a length of time, the returns have not been so large as expected; but the fact that the works are now less dependent on the season affords ground for anticipating more satisfactory results during the present financial year. A more serious impediment to profitable working con-

sisted in the extreme depression in the market value of copper. When the company was formed the price of bars was upwards of 70s. per ton; at the time of the last meeting it had fallen to about 57s. per ton, while in July last it reached the unexampled price of 53s. per ton. Had the ore sold up to the present time (including the October sale) been realised on the basis of 70s. for bars the company would have received at least 2700l. more for it than it has actually done. It is, therefore, gratifying to observe that the copper trade has recently advanced a decided revival; and there appear to be reasons for hoping the advance in price will be further augmented. As a result of the prolonged depression, combined with the causes previously named, the directors found themselves obliged to obtain a temporary advance for the company, and they evinced their confidence in its future prosperity by making themselves personally liable for the sum of 1000l.

The profit and loss account is charged with the depreciation in the buildings, plant, and machinery since the company acquired them, and also with a percentage of the exploration and development account; the balance of profit carried forward is thus reduced from 935s. 14s. 4d. to 368s. 18s. 10d. Although they regret this result, the directors cannot but consider that the revenue of the year is fairly chargeable with those items—in fact, they are convinced that this is the only sound method of treating the capital expenditure. Nevertheless, bearing in mind the special difficulties which have been encountered, it is satisfactory that the mine has so nearly sustained its working cost through a period of such severe depression. The management is on the most economical scale, and every effort continues to be made to reduce the current output, and at the same time to increase the efficiency of the working, and guard carefully the permanent interests of the shareholders, and the directors confidently believe that the arrangements made and the results attained are not only the best which were possible in the circumstances, but are such as will tend to ensure the solidity of the undertaking. While the productiveness of the mine has not diminished as regards either the quantity or richness of the ore, the surface appliances have been rendered more adequate; it may, therefore, be reasonably hoped that with an improved price for copper substantial results will ensue in the year now commenced. Major John Ross has resigned his seat as a director, and the board has elected Mr. Jonah Hadley to fill the vacancy thus created. Very cordially to retire at the meeting are Messrs. Robert Johnson and William Keith, jun., both of whom are eligible, and offer themselves for re-election. The auditor, Mr. Fred. W. Smith, also retires, but offers himself for re-election.

The following report, received on the previous day from the manager, and supplementing the information given in the report of the directors, was also read:—

Dec. 12.—Underground: Hadley's engine-shaft is now being sunk, and has reached a depth of 13 metres below the 140 metre level; the rock consists of a very congenial clay-slate or killas, which is favourable for progress. Within the last 6 ft. sinking a branch or feeder has been intersected, composed of quartz impregnated with copper ore, and with an underlie towards the lode; this is a very favourable indication, and at its junction with the lode good results may be anticipated. We expect to meet the lode in the shaft at or about the 160 metre level, and, judging from present sinking, we hope to reach that depth by the end of January, 1880.—South Section: The 140 metre level, north of cross-cut, east of level, is driven 23 metres; for the greater part of this distance we drove through a good course of ore which is still standing in the sole of the level. In the back of this level a stope is being worked, by six men, at 102 metres, the best which is worth 15s. per fathom—this stope is on the footwall of the lode. About 46 ft. behind the 140 end a level is being driven, north of cross-cut, west of the level, on the hanging-wall of the lode; the object of this drive is to come under a course of ore discovered west of the basalt from a stope above this point—the importance of this discovery can hardly be overestimated, since it proves that the ore makes on both sides of the basalt, a fact unknown to the old workers. In the back of the 140 metre level two stopes are being worked, by 12 men, at 15 and 16 marks per metre; lode worth for copper ore 10s. and 15s. per fathom respectively. The 100 metre level is driven north of shaft 102 metres. The present end is disturbed by the intersection of a small cross-course; judging, however, from the encouraging appearance of the cross-course, the improved character of the lode up to the same, the water issuing from the end, and the favourable nature of the ground, we have strong reason to believe that on reaching the lode, south of cross-course, it will be found productive—driving, by four men, at 30 marks per metre. There are three stopes being worked in the back of the 120 metre level, by 20 men; lode worth for copper ore 10s., 15s., and 30s. per fathom respectively, and a fourth on the footwall of the lode worth 8s. per fathom. We intend to drive a level to continue the drive of the 100 metre level, so as to come over the rich ground opened in the 120.

North Section: The 140 metre level is driven north of shaft 11 metres; at this point we met with a large slide, which has disturbed the lode; seeing, however, that the lode produced some rich copper ore directly up to the slide, we think it will probably prove equally good north of same, as in this district lodes are invariably found productive at and about slides. Two men are employed in clearing the 120 metre level, north of rise, north of shaft, with a view of driving this end to come under the course of ore driven through in the 100 metre level. The 100 metre level is driven north of footwall rise 8 metres; the lode in the end is 5 ft. wide, and has recently much improved in appearance, the yellow, yielding good saving work for copper; looking at the encouraging nature of the lode in the end a change for the better may be expected daily; driving by six men, at 50 marks per metre. This level will be pushed on with energy, not only to develop this part of the mine, but also with a view of cutting the rich course of copper ore seen in the deep adit level north of Alexander shaft. This shoot of ore being entirely separate from that now being developed south of Hadley's shaft, its intersection at this level is of the highest importance, and in addition a profitable section of ground will doubtless be opened up in the course of the driving. It is specially worthy of remark that this level will give 100 metres back—a great feature for the future of the mine.

In the back of the 100 north we have discovered another very nice branch of copper ore left by the old workers; so far as cut into it is worth 18 p.m. A level has been set to three men to open on its course south of rise at 18 marks per metre. We consider this a very important discovery, and one likely to yield a quantity of copper ore. It should not be lost sight of that this is the second discovery of copper ore we have made in this rise by carefully exploring the ground left standing by the old workers, on the conviction, gained from the discovery of the lode, that the deeper levels, that they had not proved the whole of the lode, believing, as they did, that the ore did not make beyond the basalt. From the first of these discoveries we raised and returned over 1000l. worth of copper ore, hence we have strong reasons for believing that a quantity of available ground was left by the old workers that will pay well to take away. In the rise between the 80 and 60 metre levels we have also found a very fine lode left standing, composed of gossan, quartz, green carbonate, and black oxide of copper—a fine looking lode, with all the indications desirable for the yield of copper ore in large quantities. This discovery gives additional support to the opinion that the operation was as to the value of the old workings. We intend to open on this branch of ore as soon as the debris in the level below is removed. Several cross-cuts have been put out from the various levels, both in the hanging and footwall of the lode, for the purpose of proving its size and value; these have been attended with profitable results, as by this means other courses of copper ore have been discovered apart from the one on which the levels were driven, thereby increasing the reserves and enhancing the value of the property.

Machinery and Surface: The old bed under the main beam of the Hadley pumping-engine has been replaced by a new one of oak; the heaving of the beam in order to accomplish this caused us a great amount of anxiety, but I am happy to state that the operation was carried through most satisfactorily, and with very little loss of time. The engine was properly adjusted, and with the addition of a new first piece of main rod, also of oak, is working admirably. A new plunger-lift has been placed in the Hadley shaft at the deep adit, for the purpose of increasing the water for dressing. The whole of the pitwork in the shaft is in excellent condition. A new crab gear has been added to the Keith drawing-engine, so that we have now sufficient power for drawing the wagons of ore to surface; this is not only of present advantage to us as regards the output, but will be a valuable adjunct in the deeper development of the mine. It is with great pleasure that I refer to the starting of the new dressing works, which took place in July last, and I am pleased to report that they are working satisfactorily. The floors have been laid out according to the most modern plan, and the ore-stuff is treated with very little manual labour, being passed through the crusher to the classifying trommels, and thence to the jiggers and round buddle direct. Preparations are being made for erecting two more buddles, so as to treat the slimes more effectually and with greater dispatch. The foundations have been completed for the stone-breaker, which is fixed in its place. The stuff after passing through the stone-breaker will be fed into the crusher automatically. We have raised the drawing-shaft 16 ft., in order to acquire sufficient elevation for forming and shooting the ore for separation before it is put into the dressing works, so as to effect a further saving in manual labour by avoiding a second lifting of the stuff. The drawing-shaft has also been thoroughly repaired, and new runners put in for the cages. The latter have been put to work, and the wagons are now drawn direct to surface. This system of drawing, besides being cheaper, has considerably assisted us in our output, and enabled us to develop the mine with greater rapidity than would have been possible with the ordinary method previously in use.

Returns: During the year the following parcels of copper ore have been shipped to Swansea:—

1879.	Centners.	English tons.	Produce.
January.....	4420	222	33½ to 7½
March.....	4300	199	25 " 5½
May.....	4263	193	20 " 9
August.....	4150	192	22½ " 9½
November.....	6301	300	22½ " 11½

We have now another parcel in course of preparation, which we expect will be upwards of 200 tons, and be shipped by the end of this month. The returns would have been considerably larger but for a difficulty we had in getting proper crusher-rolls to suit the hardness of the stuff, which retarded our progress very much. I am, however, pleased to state that this difficulty has been overcome, and rolls obtained adapted for the purpose, which answer well. The very severe winter we experienced formed another impediment to our dressing operations. These and other circumstances entirely baffled us; but, as our works are now more protected from the weather and the crusher working well, I feel satisfied that we shall now be better able to avail ourselves of the healthy condition of the mine for the purpose of increasing the output. In conclusion, I would remark that, although our returns for the past twelve months have not realised our expectation, yet, looking at the improved conditions on which we enter on the present year as regards our winding and dressing machinery, and the large extent of ore ground immediately available, with every prospect of opening out increasing reserves in our several drivages, both north and south of shaft, I have every confidence that we may look for a greatly augmented return from our fair profits may be reasonably expected. Number of persons at present employed:—122 men, 50 boys, 17 girls—total, 189.—R. K. ROSKILLY.

The SECRETARY also read the following extracts from a letter received that morning from the manager:—

Dec. 13.—"Herewith I beg to hand you particulars of this week's return—444 centners for five days' working, Monday being holiday. In consequence of the very severe weather during the week the dressing has been much interfered with, and it is still very cold. The various points of operation underground continue much the same as when reported on yesterday for the meeting. We have put the men to cut into and open on the lode, north of the rise, between the 100 and 80 metre levels, and I am pleased to state, so far as opened on, it is looking well, and yielding some beautiful copper ore. We have not as yet covered in the stone-breaker, and with the present state of the weather there is scarcely any thing to be done at surface."

The CHAIRMAN formally moved the adoption and reception of the directors' report and the accounts, and said he should be happy to answer any questions.—Mr. T. DICKINS, J.P., seconded the resolution, which was put and carried without any discussion.

Mr. DAVIDGE said he thought the report was satisfactory, and did not call for any remark. He could only hope that prices would continue to go better.

The CHAIRMAN said he hoped so too. The past year had been one of unexampled depression, especially in the copper trade. If copper had ruled at the same price which it was at when the company commenced operations the proceeds of the sales would have amounted to nearly 3000*l.* more, which would probably have left a margin for dividend. The mine continued to open out satisfactorily. At the mine they had had to contend with cold and wet weather; they could not get on with the buildings, and everything seemed to retard operations; but he hoped and believed that the current year's operations would see the company in a different position. He might mention that Mr. Keith (one of the directors) and himself visited the mine about three weeks since, and went thoroughly through the works, and carefully inspected the machinery.

Mr. DAVIDGE: That is very satisfactory to the proprietors. (Hear.) The CHAIRMAN said that in consequence of continued absence in London, and afterwards in Germany, Mr. Keith, who lived in Scotland, was unable to attend the meeting to-day, but for the satisfaction of the Scotch shareholders Mr. Keith had called a meeting in Aberdeen, and gentlemen attended that meeting to an extent representing 8000*l.* worth of shares, and the board had received from Mr. Keith a report of that meeting, which stated that the meeting desired to record their great satisfaction with what they had heard and with the prospects held out in Mr. Keith's statement. The meeting also passed resolutions cordially thanking Mr. Keith and Mr. Alderman Hadley for the care and attention they had given to the interests of the shareholders and the time they had placed at their disposal.

The CHAIRMAN, in reply to a shareholder, said that Mr. Reid, who presided over the Aberdeen meeting, held 4000*l.* worth of shares, and Major Ross, another gentleman who had attended that meeting, 1600*l.* worth. The directors were doing everything in their power to promote the development and prosperity of the mine, and were keeping down the expenses in every possible way, and exercising the utmost economy; and he ventured to say that there was no mine in the world more economically managed than this, both as far as the directors and the management generally were concerned. (Hear, hear.) There was no large staff. The board hoped next year to increase the number of men in the mine, and thus increase returns; the machinery was in the best possible state of efficiency, and if the copper market continued to improve they would get the benefit of it.

Mr. DAVIDGE said the valuable discoveries in the old workings were an important thing for the company.

The CHAIRMAN agreed that it was a very important thing indeed. The old workers thought the basalt cut out the lode; but instead of that it appeared to make the lode, as they have recently discovered that the ore makes on both sides of the basalt.

On the motion of Mr. DAVIDGE, seconded by Mr. SIDNEY H. HADLEY, the retiring directors—Mr. R. Johnson, and Mr. W. Keith, jun.—were re-elected.

On the motion of Mr. S. H. HADLEY, seconded by Mr. DAVIDGE, the auditor—Mr. Fred. W. Smith—was re-elected.

A vote of thanks to the Chairman, directors, and manager closed the proceedings.

BUENA VENTURA COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Queen-street-place, on Thursday, Mr. WILLIAM COX in the chair.

Mr. HENRY SWAFFIELD (the secretary) read the notice convening the meeting. The report and accounts were taken as read.

The CHAIRMAN said he had one or two observations to make, but he would not detain the shareholders very long, as the directors had endeavoured to give all the information possible in the report, and as no doubt his friend Mr. John Taylor would have a few words to say on the mining operations, he (the Chairman) would not enter upon that, but he would give a general sketch of the position of the company and its finances. The shareholders would have observed from the report that the company had now nine pertinencias, extending for a length of about one mile and a half. In saying this he thought he had said enough to convince them that with no very large sum of money they had acquired a very large property. The pertinencias were the Buena Fortuna, and Capricho, the Feliza, Libra, Atilana, Iberia, and Emma; and within the last month or two they had acquired two other pertinencias—the Casualidad and Contrabando. The Feliza was the particular pertinencia upon which he fixed his hopes. With regard to Feliza, it had been stated that when the original owners were driven out by force of water they were obtaining 150 tons of ore per month; and it was expected that when this company reached the 30 fathoms level—to which it was supposed that the water had risen—they would be able to test the truth of this statement; but when the 30 fm. level was reached it was found that the original adventurers, taking advantage of very dry weather, scooped the ore out considerably lower than 30 fms. He (the Chairman) was not, therefore, in a position to tell the shareholders that they were at present able to get 150 tons of ore a month from this pertinencia; but Mr. Tonkin was doing his utmost to sink to a 40 fathom level, and by the time that was accomplished they would be able to ascertain whether it was or was not true that 150 tons per month could be obtained. With respect to the financial position of the company, they had at the present moment an unexpended capital of 594*l.*, but that would be reduced somewhat, as they had to pay about 350*l.* for the Casualidad and Contrabando properties, and, therefore, he would calculate the unexpended capital, leaving something at the bankers at 5400*l.* The costs were not at present, but they would be in the course of a very short time, about 600*l.* per month; therefore, they had money enough in hand, with the further calls, to go on for nine months at 600*l.* per month. If they could obtain 30 tons of ore per month at the present price of ore in Spain—close upon 10*l.* per ton—they would be able to go on for eighteen months, and if there were any truth at all in the statement to which he had referred—as to a monthly return of 150 tons—then so far from there being any question of going on for nine or eighteen months, they would be able to pay all the costs and leave a considerable balance in favour of the mine and the shareholders. They expected to sell about 50 tons of ore at the beginning of next month from the other mines, but personally he relied particularly on the Feliza property. He had had some experience of the people in the Linares district, and he had found that when they said a mine was a good one it had generally turned out to be true; still, if the company only got 50 tons instead of 150 tons per month they would have no cause for regret, because they could bring in all the other resources in the properties. If from Feliza they only raised from 30 to 80 tons a month, with what they would get from the other mines, they would not only pay all the costs, but they would be something for the shareholders besides. The CHAIRMAN then moved the adoption of the reports and accounts.—Mr. DONAGAN seconded the motion.

Mr. JOHN TAYLOR said the mines in this district lay to the north of the mines held by the Linares Company. He (Mr. Taylor) was one of a party which visited the properties in June, 1878, and in accordance with Mr. Tonkin's recommendations they took them up, and almost all the agents in the mines with which his firm was connected were anxious to take up shares, and did take shares, in this company, thus showing that they thought well of the properties at any rate. The party spent a day in examining the veins as well as they could, and in seeing the position of the mines; and they were much struck with what they saw. The granite was of an unusual character, and the ore was a fine rich galena. The position of the mines was altogether favourable, and upon the strength of their observations they agreed to form a company, and to go on in a quiet way—not to rush into a large expenditure, but to open out the veins, and see what they could do. Some of the old shafts had been straightened and deepened, and the levels had been driven some length on the lode, but it was rather too soon to look for any great results yet. (Hear, hear.) So far as they had seen, however, the prospects were of considerable promise. Their faith was strong that they had got hold of a good district, separated by a mile or two of ground from the mines of the Alamillos, Fortuna, and Linares Mining Companies, and he was happy to say he believed the company had made a very good bargain. As the shareholders were aware, the company had not a large amount of capital left, and the directors would take very good care to husband what they had as well as they could. Meantime they would be getting ore, which luckily would sell at a very good price, and they would get as much ore as they could to relieve the cost to a certain extent, and at the same time to open up the mines as rapidly as possible. He could only tell the shareholders that his faith in the properties was not shaken. They had not dropped down upon such good bunches of ore as it was thought they would have done—perhaps they had been a little over sanguine—but they had got some good ore, and the ground was easy to mine, and the abundance of water was very useful to them. Mr. Tonkin was quite satisfied with the results and with the general prospects of the mine. With regard to the price of lead, he might mention that it had been down to 13*l.* 7*s.* 6*d.* per ton, but if their lead was sold to-day they could get 18*l.* 10*s.* per ton, a very material advance, and they looked forward to something better than 18*l.* 10*s.* in the beginning of the year. His impression was that the price of lead would go better, the reason being that the article was scarce, and while the consumption was very large the production had not increased, but had, on the contrary, rather diminished, and it was hoped that with the turn of the year they might see better prices for lead. He would be glad if Mr. Hestey, one of the directors who had visited the mine since he (Mr. Taylor) was there, would state his opinion on the properties.

Mr. ROBERT HENRY said his opinion was simply that of an amateur, but he had had the opportunity of riding over the ground in March last. At that time they

were raising ore; but, as Mr. Taylor had remarked, the expectations of Mr. Tonkin had not been fully realised as soon as expected, but as they got deeper these expectations might be fully borne out. Between the Emma property and the other pertinencias there was a wide space where the river passed down, and when he was there he saw two or three sets of people raising very fine lumps of ore simply by means of a windlass—which raised the water with one bucket and the ore with another—in a very small way; but they had some nice ore at surface, which Mr. Tonkin said was worth 2 tons to the fathom. The pertinencias to the extreme left, beyond the river, had the reputation of being the richest and most productive of the whole. He had nothing further to add to what had been said by the Chairman and Mr. Taylor, except that he had taken a greater interest in the property since he had seen it with his own eyes. (Hear, hear.)

The report and accounts were then unanimously adopted.

The CHAIRMAN then moved the re-election of Messrs. Henry D. Abercrombie and Frederick W. Bigge, the directors retiring by rotation, and in doing so said Mr. Tonkin in his last letter had expressed his opinion that the properties owned by the company were already worth considerably more than was paid for them.

Mr. DIENER seconded the motion, which was carried.

On the motion of the CHAIRMAN, seconded by Mr. DONAGAN, the auditors, Messrs. H. H. Oakes and J. W. Jepps, were re-appointed.

Mr. DONAGAN, in moving a vote of thanks to the Chairman, referred to the names of the various proprietors, and said whoever gave one of them the name of Emma could not have been very well acquainted with the proceedings of the London Stock Exchange.

Mr. JEPPS seconded the motion, which was carried; and the CHAIRMAN, in acknowledging the compliment, said it would be unwise to alter the title of Emma, as it was a local name, and any alteration of it might lead to complication. Perhaps this property would retrieve the name of Emma in London.

The meeting then terminated.

THE EMMA MINING COMPANY.

The annual meeting of the shareholders of the Emma Silver Mining Company (Limited) was held on Wednesday at the Cannon-street Hotel, Mr. A. W. MACDOUGALL presiding.

The directors in their report, after stating that the litigation in the English Courts might now be considered concluded, gave the following summary of the results obtained since they assumed office. The total amount realised was 32,840*l.* 13*s.* 10*d.* and the total amount recovered but not yet realised was 148,657*l.* 8*s.* 3*d.* Of the unrealised assets, the Board expected a settlement in all of the following:—Trustee (balance not yet paid), 1875*l.*; Mr. George Grant, 500*l.*; Messrs. Grant, 367*l.* 4*s.* 9*d.*; and Mr. Maurice Grant, 2868*l.* 18*s.* 7*d.*; altogether, 8913*l.* 3*s.* 4*d.* There then remained the difficult question of the realisation of the amount recovered by judgment against Mr. Albert Grant—139,774*l.* 4*s.* 11*d.*

The CHAIRMAN stated that the Board recommended that the consideration of the report and accounts of the Gardiner Board should be held in abeyance until it was discovered to what extent the company had suffered through their proceedings. He believed that the Gardiner Board were tampered with by the promoters, partly because that Board had acted in defiance of the wishes of the shareholders in plunging them into litigation in America in which they had no chance of succeeding. The action was one by common law to be tried before an American jury, and American jurors had not the confidence of English people.

Mr. GEORGE M'HENRY: That is a very impudent remark.

The CHAIRMAN repeated his assertion, and said that the action was brought for fraudulent misrepresentations and concealments on the contract of the sale of the Emma Mine and other property against Park and Baxter. There was nothing more difficult than to prove the intent of a person. The action after a long trial, ended in a verdict for the defendants. Against that the directors had appealed to the Supreme Court, but the Court of the United States had advised that they should be successful. It would gratify everyone to know that they were now at the end of their litigation in England. Holding as they did a verdict against Mr. Albert Grant, they would, whenever they could, endeavour to get what they could of the moneys which he had improperly received as trustee of the company.—Mr. C. W. C. HUTTON seconded the motion.

Mr. G. M'HENRY moved a number of amendments, to the effect that the report be not accepted; that a committee be appointed to examine into the accounts since the accession of the present Board, and that the directors' resignation be accepted; but the amendments were not seconded, and after further discussion the report was adopted.

A vote of thanks to the Chairman concluded the meeting.

GREAT HOLWAY LEAD COMPANY.

An ordinary general meeting of shareholders was held at the offices, Great St. Helens, on Thursday, Sir STEPHEN WALCOTT, K.C.M.G., in the chair.

Mr. E. J. BARTLETT (the secretary) read the notice convening the meeting. The following report from Mr. Parry was also read:—

Dec. 16.—Local managing director's report: I have pleasure in handing you my report on the above mine for presentation at the ordinary general meeting to be held on the 18th inst., and I trust it will prove interesting to the shareholders generally.—Roskell's Shaft: It is necessary for me to go further back than Aug. 12 last, when my co-directors and I were present at the meeting of the directors, to give you a full and complete account of the position of affairs at the time. Since the date named a very large amount of work has been accomplished. The 12-in. pumps being at hand, it was thought they might perhaps be utilised, and a fair trial was given them, but they were found too small to cope with the water, which, owing to the unusually wet season, was then very strong. It was, therefore, decided to replace them by the permanent 22-in. pumps, and with the aid of the steam capstan the operation was without delay or accident most successfully carried through. The shaft having been equipped with strong bearers and divisions, the engine was set to work, and in a few days had forced the water. Orders were then given to commence cutting the piece of ground which prevented the water flowing from the 80 yard level, east of level engine-shaft, the point at which the discovery of ore was made some time since; this operation will be complete by the end of the month, when men can at once be placed to work the ore referred to without interfering with the sinking of Roskell's shaft, which will be urged on forthwith. We have also in the meantime attached the balance-bob to the main-roads, this steadies the motion considerably, and the whole machinery is now working so smoothly that little noise can be heard. We have also by this means greatly reduced the consumption of coal. Two kilns, for preparing the ore, and the engine will very shortly be finished, and the drains leading from the engine-house to the stream below have been built and covered. A shed has been erected over the boiler and capstan-engine, and a large amount of the material lately purchased remains to cover the dressing-floors (the levelling of which is nearly completed) when required.

The adit level is now in thorough repair along its whole course, and several points have been stopped where the water was getting through to the ground below, so that the engine will now have much less water to contend with. These matters have, of course, taken time to accomplish, but it is satisfactory to state that since pumping was started the level of water throughout the district has fallen, and must not be overlooked below the adit, so that ere long we may see a consequent reduction in the consumption of fuel.—Garden Shaft: Our actual mining operations have of late been confined to this part of the set, where it was thought there would be a fair chance of raising lead and blende, and of proving the continuance of the Holway vein east. I am happy to say we found the latter maintaining its proper course through the shale, where our predecessors imagined it came to an end, and we have raised therefrom some lead, and a considerable quantity of blende of very superior quality. As the ground and runs of ore are dipping in the same direction east we have for the present discontinued driving the level, as we shall have no doubt in the end, be able to work it to great advantage. The driving of No. 2 west presents a promising appearance, and is likely to open up a rich piece of ground. The stoping in the roof in the same direction is producing some good blende and lead. I saw to-day a very fine specimen of the latter quite solid, and the men say an improvement is taking place.

Since discontinuing the sinking men have been placed in the shaft some yards below the level to drive east, where there were some indications of the vein undergoing a change. They found a split had occurred, one part of the vein taking its proper course along the heading side, and the other going north with a rib of blende about 8 in. wide, and some good spec. of lead. At present it is uncertain whether this may be a further leading of the Holway vein, similar to that at Partridge or Roskell's, but we shall very soon be able to judge of this. With regard to the future prospects of the mine, I am pleased to say the high opinion I have always held on the subject remains unchanged, and with the improved prices for lead and blende, which seem likely to further advance, a great success appears to be in store for us. All the heavy work has been completed. We have now to sink Roskell's shaft to the Holway lode (say) a further depth of 40 yards, which, with the aid of boring-machinery purchased some time since, should not be a long operation, and while this is proceeding I am in hopes of raising large quantities of ore from the 80 east. Partridge shaft is in almost rigid ground, and so far as worked has proved a fine lead, and again at Eytton's shaft 50 tons of ore per month may be raised. At both of these places ample machinery is already erected, and will in a short time be brought into play, and we shall on the completion of Roskell's shaft be in a position to work the Holway lode for a mile at least along the whole length of our set, and in most places to a depth of 100 yards below the present adit level. Of the other north and south veins traversing through the set I have made no mention, but all have produced lead in paying quantities, and it is, therefore, in my opinion simply a matter of a little more patience and perseverance on the part of shareholders to bring the mine permanently into the Dividend List.—W. PARRY.

The CHAIRMAN moved that the balance-sheet and directors' report be received and adopted, and passed and allowed. He said he might state, generally, that on the last occasion when they met—in August last—the affairs of the company were so fully gone into that little was left to be said on the present occasion, except to notice what had taken place between that time and the present. They had had to contend with water, which had kept them back a considerable time. The directors now hoped they were at the end of their difficulties in that respect, the operations of the engine at Roskell's shaft having effected its object to a considerable extent, the surrounding district having been drained. The work of the engines fully justified the expectations held regarding it. When Roskell's shaft was emptied, it was found that between that shaft and the level engine-shaft a sort of inclined plane had prevented a considerable quantity of water from going into Roskell's shaft to be pumped out; that inclined plane was now being levelled, and when that was done the water would find its way more readily to Roskell's shaft, and in that way the set would be more readily drained. When this was done they would be able to place men at work all over the set. Until this was done they must exercise a little patience. A little further expenditure would be necessary to complete the whole thing, and thus start with a prospect of very early success. Instead of leasing the reserve share, the directors thought that a more preferable way was to raise a small sum by debentures, which would not be a permanent charge upon the mine, but could be paid off at fixed periods, and leave the profits to be divided amongst the shareholders. They would be issued shortly, and he hoped before the money so raised was expended they would be able to talk about dividends.

Mr. EASTES seconded the motion for the adoption of the report and accounts.

Mr. E. J. BARTLETT said the shareholders would notice an item of 83*l.* 2*s.* 2*d.* for "sundry charges (taxes, advertising, stamps, &c.), London and local"; a good portion of that amount was paid for inspection by eminent engineers, and a portion for the insurance of a cargo of machinery on the transit to the mine. There was an item of "travelling expenses, 57*l.* 7*s.* 7*d.*," of this 4*l.* 5*s.* was for local charges, and the remainder for the visits of the directors and himself. Regarding the directors' fees, it was stated in a side note that these were for seventeen months, a moiety having been paid in shares; but this statement scarcely conveyed the real fact, because the directors had received but a small amount in cash since they met the shareholders. With regard to the working of the undertaking, the Chairman and Mr. Parry had entered so fully into the various operations since August last, that it would be unnecessary to detain the meeting with many remarks, but having taken a deep interest in the affairs of the company, and being besides a large shareholder, perhaps a few observations might not be out of place. (Hear, hear.) A very valuable discovery was made at the Level Engine-shaft from the 80 some months since, and it was in consequence of the water that it was decided to make Roskell's shaft the centre of all the pumping arrangements and industrial operations, that shaft being most conveniently situated with regard to the roads and smelting-house. Therefore the board decided to put machinery upon Roskell's shaft, and to erect sufficient dressing-floors there. The present position was that it had been found necessary to cut the ground between Roskell's shaft and the Level Engine-shaft at the 80, in order to allow the water to drain from the latter to Roskell's shaft. He hoped that in about a month that work would be accomplished, and the water drained away, and then they would be raising lead to bank; and by an arrangement which was being carried out on the surface, he hoped they would be sufficiently forward with the dressing-floors, so as not to allow the lead to wait before it was returned to market. There was one point he might mention. In cutting the ground between the two shafts it was anticipated they would be cutting what was called dead rock; but after the men had been at work some few weeks they intersected a new joint or vein, found to be quite as rich for silver as those which had been previously cut. It was found that this joint was not productive above the 80; but at about the bottom of the 80, and as far as it had been proved in depth, it seemed to open out and improve as the men worked upon the course. This was about 50 yards from the shaft. He had not had the ore assayed, but he thought it would yield about 15 oz. to the ton, and would be worth about 13*l.* 10*s.* to 14*l.* per ton. This was a point which had not been mentioned in the report, nor did he now wish to make it of importance; but he mentioned it because it was an additional evidence that, as far as they had gone, they had really not done justice to the property in the prospectus regarding the number of veins they were able to work when the mine was in the state he hoped it would be in in a month or six weeks. (Hear, hear.) As far as the 80 was concerned there was no speculation. The manager valued the lead at 3 tons per fathom, and they had simply to tram it to a point at Roskell's and draw it up, and he believed it would ultimately give them 50 tons per month. There was another part of the mine, namely Eytton's Shaft. There was the best of evidence that at the time Eytton's workings had to be abandoned in consequence of their not having sufficient machinery to cope with the water, 50 or 80 tons per month could be raised. The question was, when could they get to Eytton's? During the last few weeks the water had been lowering, and was now decreasing week by week. To show that the directors were not losing sight of any one point, he might mention it had been decided that as soon as the water was lowered 20 or 30 yards the present machinery would be put in order, and so hasten the probable return of 50 or 60 tons of lead from that point. (Hear, hear.) As regarded Partridge shaft, they knew that a rich course of ore existed there. So the question was not one of proving the mine, but whether they could centre their operations, and erect sufficient machinery and plant, so as to enable all the veins to be permanently unwatered, and so get the ore raised upon the most economical principle. The only experiment the company had ventured upon was to sink the powerful engine upon Roskell's shaft, and the question was whether that was sufficient to raise the water. As far as their experience went, they had an engine working at the present time up to six strokes per minute (capable of working up to 12), and draining a larger quantity of water than they ever expected, and since it had been working not a single hitch had occurred, and the expectations of the board had been more than equalled by what the engine had actually done. So that if ever there had been any speculation with regard to placing the engine there that was all over now; and all they had to look to was to develop the enormous lodes, and return the ore to the best advantage, expending as little money as possible during the time it was necessary to complete the operations. He would not say anything regarding Garden Shaft, as that was referred to in Mr. Parry's report. He might mention to the meeting that they had in reserve the sum of 21,675*l.* towards a balance of liabilities of about 1900*l.* The directors and their friends, and himself and his friends, were interested in this undertaking to the extent of 3380 shares; they had borne the burden and heat of the day, and taken shares from the commencement. As he had said, as far as experiments were concerned they were at an end, and they had now a rich property to develop. The board had taken into consideration whether it was desirable in the interests of the shareholders that there should be a fresh issue of shares at present, the shares should be worth a premium; but what they ought to be worth and what they were actually worth were two different things. They required a portion of the 21,675*l.*, and what the board suggested was whether it would not be better to raise what little money was wanted by debentures, which could be paid off when the funds of the company permitted, whereas if they issued fresh share capital it would be a permanent charge upon the undertaking. When he last had the pleasure of addressing the shareholders he stated his belief that they were going to have an advance in the price of lead, and in all metals, from which the company would reap great advantages. He was happy to say that his predictions had been fulfilled, for pig-lead was now up to 18*l.* 10*s.* and 18*l.* 15*s.*, and he believed that before the end of January it would be up to 20*l.* per ton. If they had sold the produce two years ago they would only have got 10*l.* per ton for it, whereas they would now get much more. Having referred to the fact that in adjoining properties they had produced thousands of tons of lead, he said that in Great Holway there was every indication that the ore would increase in value as depth was attained, which would make this property a very valuable property indeed.

A SHAREHOLDER asked what amount it was proposed to raise on debentures? Mr. E. J. BARTLETT: We have power to raise 10,000*l.*, but I should think 3000*l.* or 4000*l.* would be sufficient, and this would be offered *pro rata* amongst the shareholders.

Mr. HERITAGE and one or two other shareholders expressed the opinion that the wisest plan would be to raise the money by debentures.

Mr. E. J. BARTLETT asked whether Mr. Alfred Thomas had anything to say regarding the property?

Mr. ALFRED THOMAS said he had so often given his opinion upon the property that it would be waste of time to say much further. On the occasion of their meeting a short time since at Holway, when the new engine started, they went fully into details, and the shareholders were satisfied with everything which had been done. Since then he had visited the mine once, and found everything in connection with the sinking of the main engine-shaft was progressing so favourably as possible, and that being the main point under consideration, nothing could be more satisfactory. It was very well known that when this shaft was sunk about 40 yards they would have a very rich course of ore which was left by the former workers owing to the water; this powerful engine-shaft would not only drain the lode, but would be in connection with Partridge and other lodes by means of cross-cuts. No doubt they would have an influx of water to contend with, but as the influx was about 900,000 gallons per day of 24 hours, whereas the engine could work up to 2,000,000, they need not fear the consequences of any influx. No doubt in the limestone, which was porous, draining was gradually taking place, but not so rapidly as when the natural veins were met with. He mentioned this because the water at Holway was somewhat of a bugbear with those who did not understand it. (Hear, hear.) At Partridge he thought they would raise 50 tons per month, and at Eytton's also. He believed they could have 200 tons per month when the mine was in full working order.

Mr. HERITAGE and Mr. THOMAS expressed their satisfaction at the way in which the mine had been worked.—The resolution for the adoption of the report and accounts was then put and carried.

On the motion of the CHAIRMAN, seconded by Mr. THOMAS, the report of Mr. Parry was adopted.

On the motion of Mr. ALFRED THOMAS, seconded by Mr. THOMAS, the retiring directors, Major-General T. Ford, R.E., and Mr. W. Wyllys Mackeson, Q.C., were re-elected.

Mr. MACKESON, in acknowledging his re-election, said that during the long vacation he spent 21 days on the mine, and from what he saw all his previous anticipations had been realised, and he had the highest opinion of the mine.

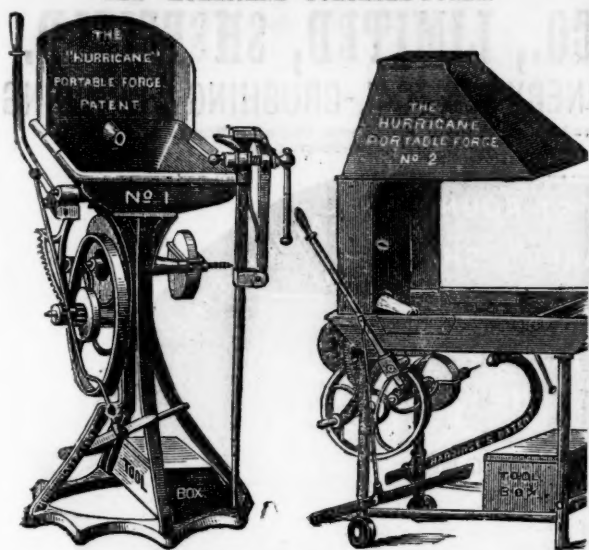
On the motion of Mr. THOMAS, seconded by Mr. WATERS, Mr. Alfred Conder was re-appointed auditor, with a remuneration of 10 guineas per annum.

A vote of thanks to the Chairman and directors closed the proceedings.

[For remainder of Meetings, see to-day's Journal.]

RUSSIA COPPER.—In presenting the report of the liquidator and committee of shareholders to the general meeting the liquidator, who acted as chairman, explained that they had made practically a small profit upon all the current going parts of the company's business. The small loss on Preobrajensky was in realising the stocks which were being worked off there at book values. They had closely considered the present state of the company's trading, and all they could do was to ask the shareholders to go on in the same position for another year, as they thought that so long as they could continue as a going concern, without making a loss in Russia, it was desirable to do so. If they could sell the Preobrajensky estates for the amount of the company's indebtedness they would bring forward the reconstruction scheme. At Voskresensky they smelted nearly 300 tons of copper in the year, but this was insufficient, and to increase it to 400 tons, which would make it remunerative, would involve an outlay of 3000*l.* They are still experimenting with the acid factory and reduction works, and are now about to put the experiments into practice by the purchase of an electric machine, which will precipitate the copper. Mr. Morgan remarked that property in Russia, with which country he is acquainted, was never in a worse state than at present, and enquired what amount they expected to get from the Preobrajensky, as they could then form their own idea as to whether they were likely to pay off the encumbrances. The liquidator stated that they were told that neighbouring timber properties were mortgaged for more than their value, and they hoped to get some Russian noble to effect a heavier mortgage than theirs, and take over the property which is mortgaged for 110,000*l.*, the Russian mortgage being 30,000*l.*, and the English mortgages 80,000*l.* On the last timber floated the loss from sinking was 27 per cent., but they preferred to take this risk, as if they sold at the bankside they would only receive a small sum in cash; and then, unless the buyer floated it successfully, they would never see him again. The report was unanimously adopted.

THE "HURRICANE" PORTABLE FORGE.



The constant reference in the mine managers' reports published in the *Mining Journal* to loss and inconvenience caused by accidents to machinery, which could they be attended to at once might have proved much less disastrous and expensive, must have been noticed by all interested in mines, and it will usually be found the smith is the most important personage in providing the remedy. But in the majority of cases the accident occurs far from the smithy, and the workmen labour under the great disadvantage of working with perhaps inappropriate tools because the proper ones are not at hand. This inconvenience need no longer be felt, for amongst the exhibits at the recent show at the Agricultural Hall was a new portable smithy—the Hurricane—which is calculated to prove quite as useful about mines and collieries as it has proved in the various other branches of industry in which it is already largely used. This new forge was patented by Mr. J. Hardinge, is manufactured by the Hurricane Portable Forge Company, of New Bridge-street, Blackfriars, and, as will be seen from the above engravings, is unusually simple and compact. The No. 2A size, weighing 184 lbs., can be conveniently moved by one man, and possesses a powerful blast, a forge, a hearth, a vice, an anvil, a tool grinder (emery wheel), a cutter, circular saw and bench, a chuck, two drills, a drill rest, and a tool box, whilst its cost being but 10l. 10s., the outlay required is not such as to prevent its general adoption. The value of so useful a combination of mechanical tools in a compact and portable form can scarcely be overestimated. Even the No. 1 size has a fan blast of such power that a 1-in. bar of iron can be heated to a welding point in 2½ minutes, and with the larger sizes more in proportion can of course be done. All the tools are under the operator's immediate control, and as he can work them with ease no assistant is necessary. All bands and cranks are dispensed with, and there are no parts that can get out of order. The whole apparatus is worked by a simple lever acting upon the patent ratchet and slip gear, and to increase its handiness a treadle is provided. The larger sizes can also be worked from a pulley by steam or other power, independently of hand or treadle. The "up and down" motion of the adjustable levers (which makes it convenient to work the fan-blast from the front, side, or back of the hearth, or at any angle to suit awkward positions) makes their working less laborious and more agreeable to the operator than the rotary motion of ordinary blowers. It is claimed that with the same amount of labour as the most improved bellows, the patent fans will produce five times the amount of blast, and they can be started instantly, as there is no dead centre to overcome, and no possibility of working the blast in a backward direction. They are more durable, less costly, never out of repair, and always reliable. The driving-wheel can be instantly tightened to the friction pulley in case of wear.

The advantage of having an entire smithy at hand at the particular point where the work is to be done will be readily appreciated by all who have seen the great waste of time which frequently follows a comparatively trifling breakage, and one which with such an apparatus as this would cause but a few hours' delay. The saving of time, for example, and consequent gain caused by having a grindstone or emery wheel to the forge will be apparent to all users of tools, as the mechanic can now re-sharpen his tools on the spot. A vice (with a small anvil attached) conveniently fixed to the frame of the forge still further increases the utility of the invention, as also do the drill, the circular saw, the chuck, and the polishing wheel. Further attachments can also be made to the fan spindle, or a small pulley fixed, from which motion can be acquired for other purposes. It is pointed out that when required the Hurricane forges can be fitted with the new water tuiere, back and hood, which is so constructed that it receives the otherwise waste heat from the fire. By this means steam is generated, and utilised for actuating an engine which can drive its own fan-blast, while the water thus heated is rendered available for cooking or other purposes. This attachment, however, would in most cases, so far as miners and colliers are concerned, be considered unnecessary, but as a portable smithy no more useful or cheaper apparatus need be desired.

SKEERNE IRONWORKS COMPANY.—A large and well-attended meeting of the shareholders in the Skeerme Ironworks, which are situated near Darlington, was held on Saturday, at the Cannon-street Hotel to hear a report from a special committee, appointed to enquire into the condition of the company before and since it went into liquidation. Mr. F. H. Jeune, barrister-at-law, one of the committee was voted to the chair. The chairman said the company had been stranded with about 50,000l. worth of debts and assets to a very limited amount. At the last meeting a question arose whether something might not be obtained on behalf of the company from the gentlemen engaged in its original formation. As a result of an interview with these gentlemen, and especially Mr. Labouchere and Mr. Stanhope, the latter had expressed themselves as being willing, without, of course, admitting any legal liability, to contribute to the re-formation of the company the sum of 20,000l. of the company's debts—that was to say, they would free the company of 20,000l. of its debts. This must be considered as a very substantial offer, and even supposing the company had gone to law against these gentlemen, and had been ever so successful against them, he much doubted if more would have been obtained, while a very long time must have elapsed before proceedings could have been ended, and thus the re-formation of the company at an early date, and its participation in the improved condition of the iron-market would have been prevented. The committee also hoped that Messrs. Pease and Hutchinson, of Darlington, who had sold the works, and who had certainly made a good bargain in the transaction, would also help the company in its efforts to start again. Mr. John Morris said Messrs. Pease and Hutchinson firmly refused to do this. It was not a question of money with these gentlemen, but one of principle, they considering if they in any way assisted the company it would be an admission that the bargain under which the works were sold was not a bona fide one. The report of the committee suggesting the re-formation of the company was adopted, and they were requested to work out the details of re-arrangement, to act as provisional directors, and to obtain the consent of the Court of Chancery to a withdrawal of the liquidation proceedings. In answer to a shareholder, Mr. Bannister, one of the committee, said the condition of the works was very satisfactory in view of the present condition of the iron market, and Mr. Morris added that already old customers, hearing that the company was going to start again, were negotiating as to prices.

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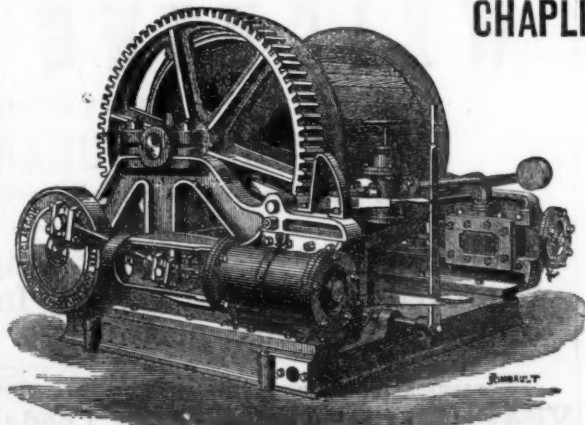
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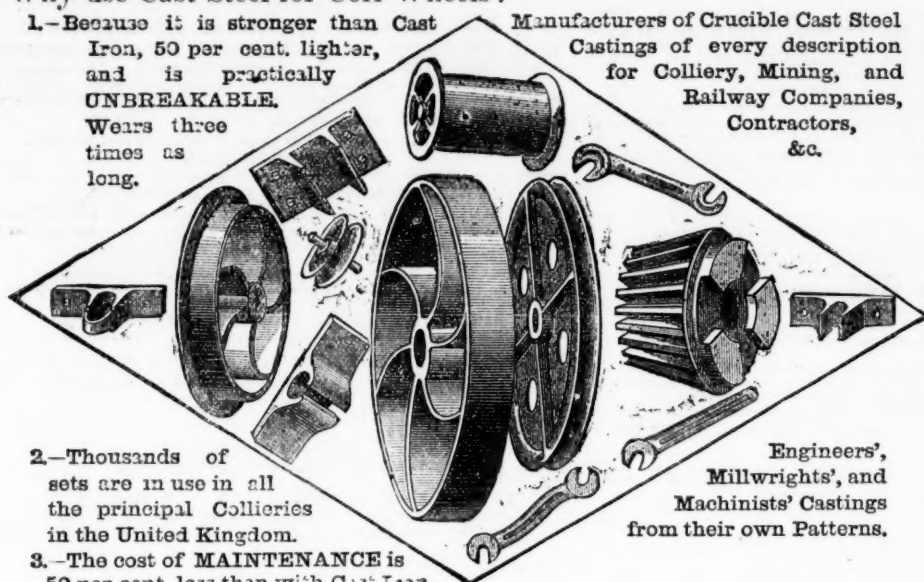
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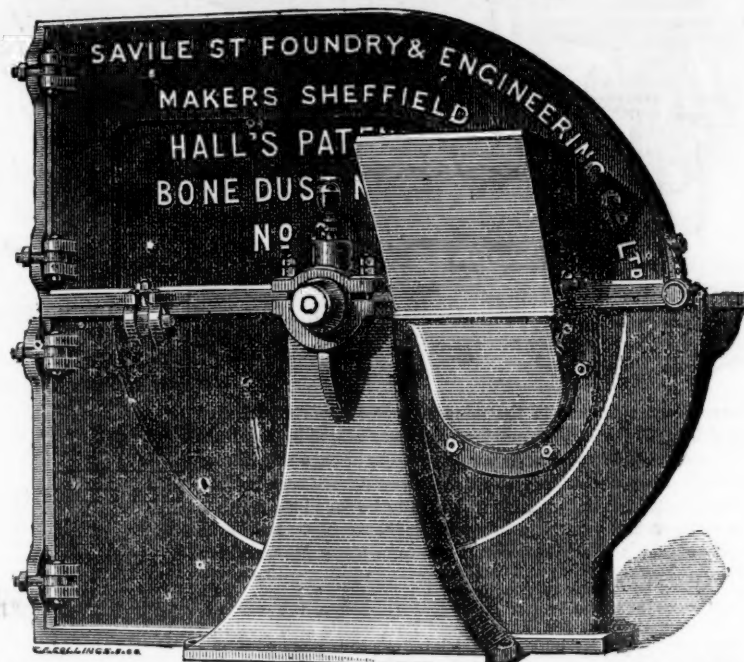
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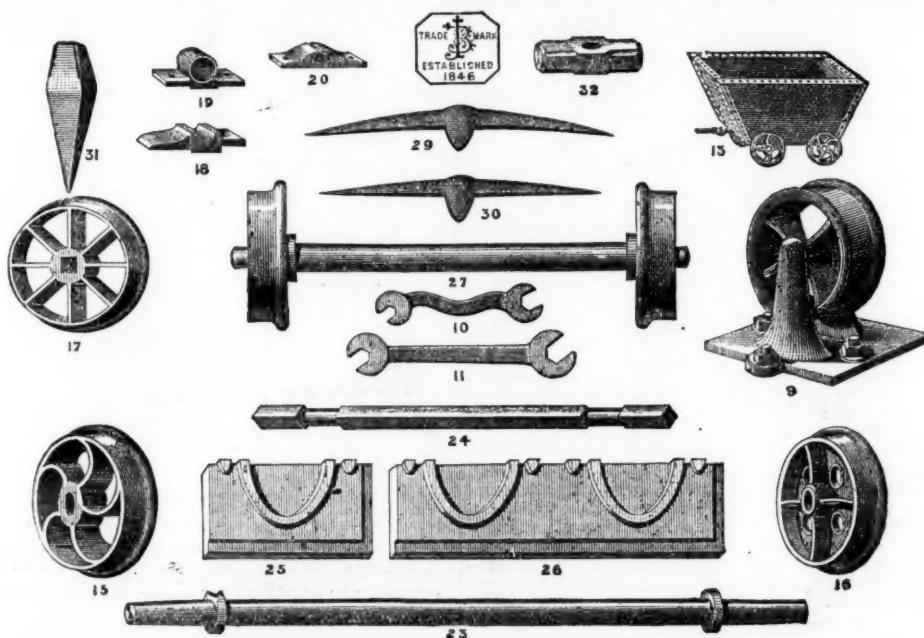
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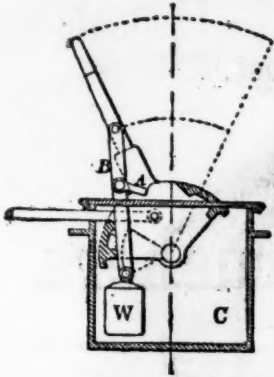
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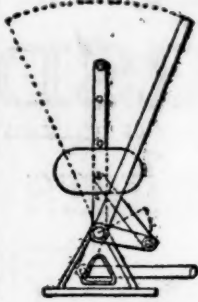
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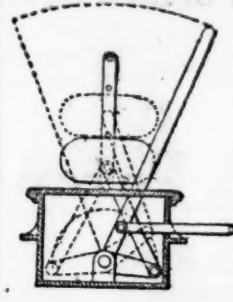
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HALF UNDERGROUND,

Will set over both ways, can be locked so as to work on one side only, or the switches can be locked on either side, so as not to work at all. Takes up less room than any other, as the weight does not turn over; works equally well if full of water; can be supplied at the price of an ordinary lever box.

Tank Locomotives, Siding Stops, Wheels, Rails, Chairs, Spikes. Bolts,

AND EVERY DESCRIPTION OF PERMANENT WAY FITTINGS.

Iron and Steel Pit Cages, Wrought-iron Roofs, Headgears, Girders, Turntables, Patent Coal Tip, Boilers, Engines, Water Cranes.

HARTLEY and ARNOUX BROTHERS, Stoke-upon-Trent.

MAY AND MOUNTAIN,

BIRMINGHAM,

Engineers, Millwrights, Ironfounders, Coppermiths, and Boiler Makers.

SOLE MANUFACTURERS OF

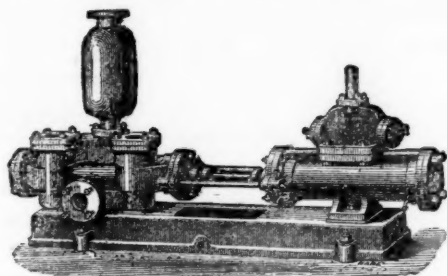
IMPROVED VERTICAL COLEBROOK'S PATENT STEAM PUMP. TORKINGTON AND HEY'S

DOUBLE-ACTING

STEAM PUMPS,

MADE IN ALL SIZES AND

COMBINATIONS.



PRICES OF A FEW LEADING SIZES.

Steam cylinder.	Water cylinder.	Stroke.	Gallons per hour.	Price.
3	1 1/2	12	720	£16
4	2	18	1,260	19
4	4	18	5,040	25
6	4	18	4,280	33
6	6	18	9,660	41
8	6	18	7,920	50
10	8	18	12,060	80

Reliable and Economical—Short Pistons and Long Strokes—Slide Valve worked by Steam alone, without Tappets, Levers, or Valves.

Adapted for all purposes and to all circumstances.

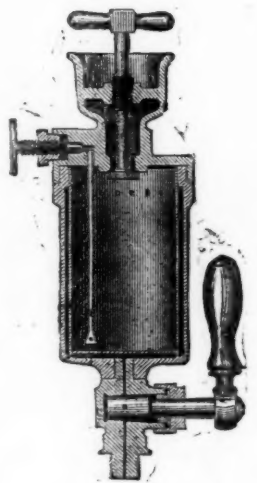
TORKINGTON & HEY'S

PATENT LUBRICATORS,

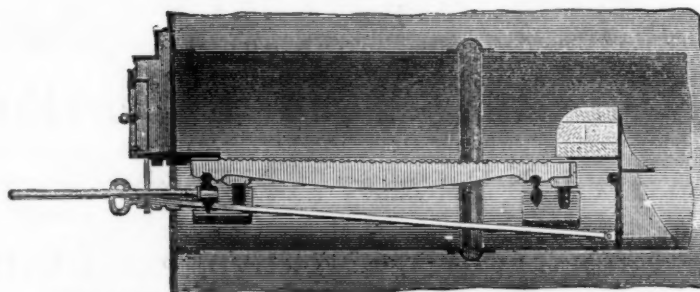
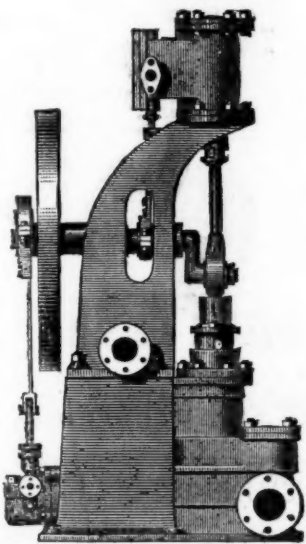
Entirely Self-acting. Flow of Grease regulated by the Steam. Perfect Lubrication.

Greatest possible Economy.

PATENT.



PRICES ON APPLICATION.



IMPROVED SMOKE PREVENTING FIRE BARS.

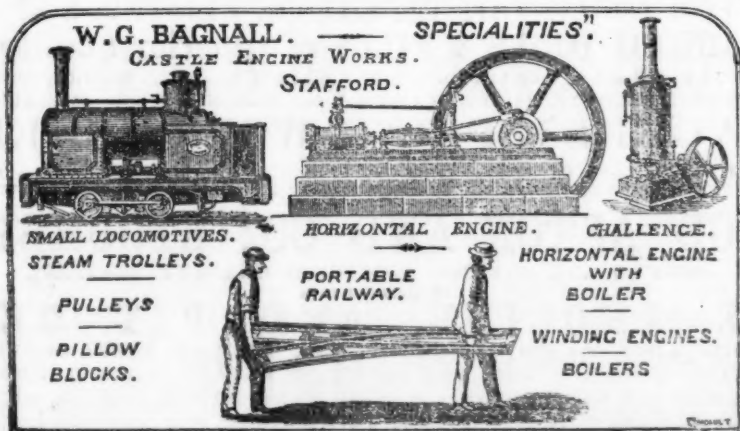
TO SUIT ANY
FLUE
OR
FURNACE.

PRICES
ON
APPLICATION.

PRICES OF LUBRICATORS.

No.	Horse-power.	Price.
1	Agricultural	7s. 6d.
2	Engines...	10 0
3	5 to 7	20 0
4	7 10	25 0
5	10 20	30 0
6	20 30	37 6
7	30 50	47 6
8	50 70	60 0
9	70 100	85 0
10	100 200	110 0

W. G. BAGNALL, STAFFORD.



PATENT DUPLEX LAMPS,

FOR COLLIERIES, IRONWORKS, &c.

SUITABLE FOR PIT BANKS, ENGINE HOUSES, &c., &c.



Each Lamp gives a light equal to 26 candles. No Breakage of Chimneys from Heat. Cottons last three months. Will burn any Mineral Oil.

S. HOOPER,
LAMP MAKER & OIL MERCHANT
LOWER TEMPLE STREET,
BIRMINGHAM.

N.B.—Lamps made suitable for every purpose.

The BEST SIGNAL BELL MADE for MINING PURPOSES.
ILLUSTRATIONS ON APPLICATION.

At the PARIS EXHIBITION the Jurors have Awarded

THE GOLD MEDAL, THE SILVER MEDAL, AND HONOURABLE MENTION
FOR MY LATEST PATENTED STONE BREAKERS AND ORE CRUSHERS.

Stones broken equal, and Ores better, than by hand, at one-tenth the cost.

H. R. MARSDEN,

ORIGINAL PATENTEE AND SOLE MAKER OF BLAKE'S

Improved Patent Stone Breakers & Ore Crushers.

New Patent Reversible Jaws,
in Sections, with Patent
Faced Backs.

NEW PATENT ADJUSTABLE
TOGGLES.

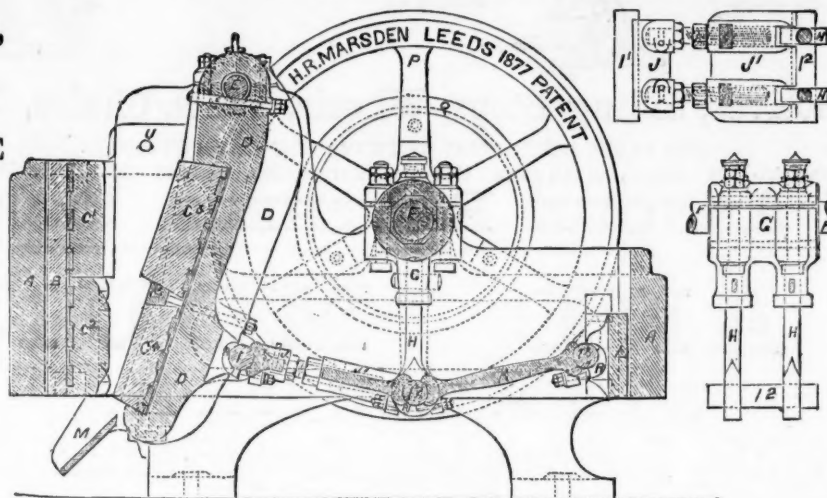
OVER 2500 IN USE.

New Patent Draw-back
Motion.

NEW PATENT STEEL TOGGLE BEARINGS.

70

PRIZE MEDALS.



READ THIS—

Wharhole Lime Works, Maryport, Whitehaven,

November 7, 1878.

H. R. MARSDEN, Esq., Soho Foundry, Meadow-lane, Leeds.
DEAR SIR,—The machine I have in use is one of the large size, 24 in. by 12 in. The quantity we are breaking daily with this one machine is 250 tons, the jaw being set to break to a size of 2½ in. We have, however, frequently broken over 300 tons per day of ten hours, and on several occasions over 350 tons during the same period. The stone we break is the blue mountain limestone, and is used as a flux in the various ironworks in this district. We have now had this machine in daily use for over two years without repairs of any kind, and have never had occasion to complain of any inconvenience in using the machine. I hope the one you are now making for me may do its work equally well. The cost—including ENGINE-POWER, COALS, ENGINEMAN, FEEDING, and all EXPENSES OF EVERY KIND—is just 3d. per ton. Should any of your friends feel desirous of seeing one of your machines at work, I shall have much pleasure in showing the one alluded to.

I am, dear Sir, yours very truly,

WILLIAM MILLER.

AND THIS—

Wharhole Lime Works, Aspatria, Cumberland,

July 11th, 1878.

H. R. MARSDEN, Esq., Soho Foundry, Leeds.
DEAR SIR,—We are in receipt of your letter of 4th inst. I may just state that the stone breaker above named has been under my personal superintendence since its erection, and I have no hesitation in saying that it is as good now as it was five years ago.

I am, dear Sir, yours faithfully,

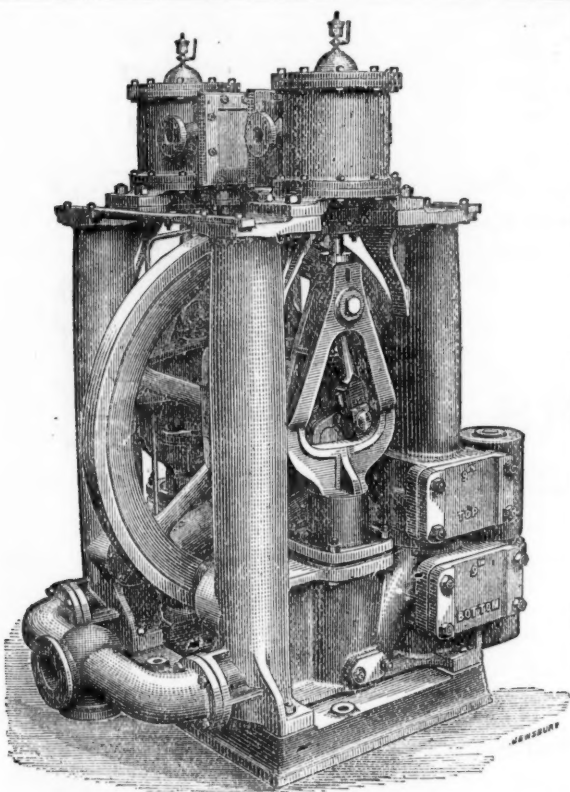
FRANCIS GOULD.

GREATLY REDUCED PRICES ON APPLICATION.

ALL BEARINGS are renewable, and made of H.R.M.'s Patent Compound ANTIFRICTION METAL.

CATALOGUES, TESTIMONIALS, &c.

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.



STEAM PUMPS for COLLIERY PURPOSES, specially adapted for Forcing Water any height; also for Sinking; and for Feeding Boilers.

JOHN CAMERON has made over SIX THOUSAND.

WORKS: OLDFIELD ROAD, SALFORD, MANCHESTER.

ASBESTOS.

ASBESTOS ENGINE PACKING,
ASBESTOS MILLBOARD JOINTING,
ASBESTOS BOILER COVERING,
ASBESTOS CEMENT,
ARE UNRIVALLED.

Sole Patentees and Manufacturers:

THE PATENT ASBESTOS MANUFACTURE CO. (LIMITED),
31, ST. VINCENT PLACE, GLASGOW,
AND 10, MARSDEN STREET, MANCHESTER.

From whom Price Lists and all information can be had.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM
(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1857.

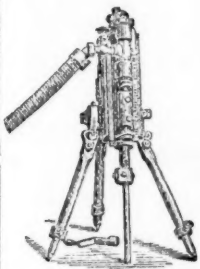
The largest and most widely circulated papers in Monmouthshire and South Wales. Chief Offices, NEWPORT, Mon.; and at CARDIFF.

The "Evening Telegram" is published Daily, the First Edition at 3 P.M.; the Second Edition at 5 P.M. On Friday, the "Telegram" is combined with the "South Wales Weekly Gazette," and Advertisements ordered for not less than Six Consecutive Insertions will be inserted at a Uniform Charge in both papers. P.O.O. and Cheques payable to HENRY RUSSELL EVANS, 14, Commercial-street, Newport, Monmouthshire.

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(ESTABLISHED 1764).
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MINE AND QUARRY STANDS, STEEL DRILLS, SPECIALLY PREPARED INDIARUBBER HOSE, TESTED IRON PIPES, &c.



Air-Compressing Machinery,

Simple, strong, and giving most excellent results, and
ELECTRIC BLASTING APPARATUS.

Full particulars of rapid and economical work effected
by this machinery, on application.

R. H. HARRIS, late

ULLATHORNE AND CO., Mechanical and Consulting Engineers,
43, QUEEN VICTORIA STREET, LONDON, E.C.

PARIS EXHIBITION,



1878.

HONOURABLE MENTION

Awarded to

SALMON, BARNES, & CO

FOR THE PATENT

ROANHEAD ROCK DRILL,

AND THE HIGHEST AWARD FOR

IRON AND WOOD REVOLVING SHUTTERS,

Worked by their PATENT BALANCE-WEIGHT MOTION.

Canal Head Foundry and Engineering Works, Ulverston,
LANCASHIRE.

PARIS EXHIBITION,



1878.

GOLD MEDAL AWARDED, PARIS EXHIBITION 1878.

THOMAS TURTON AND SONS,

MANUFACTURERS OF

MINING STEEL of every description.

CAST STEEL FOR TOOLS. CHISEL. SHEAR, BLISTER, & SPRING STEEL
MINING TOOLS & FILES of superior quality.

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS.
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

SHEAF WORKS & SPRING WORKS, SHEFFIELD.

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Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES, FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS, RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Orab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions.
STOURBRIDGE FIRE BRICKS AND CLAY.